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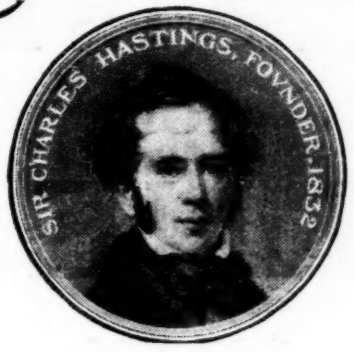

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A British Medical Association Lecture

ON

SOME CLINICAL MANIFESTATIONS OF TABES DORSALIS.

DELIVERED TO THE HARROGATE BRANCH, OCTOBER 7TH, 1922,

BY

GORDON HOLMES, M.D., F.R.C.P., C.M.G., C.B.E.,

PHYSICIAN TO OUT-PATIENTS, NATIONAL HOSPITAL; ASSISTANT PHYSICIAN, CHARING CROSS HOSPITAL.

THERE can be little doubt that no nervous disease presents itself under so many and varied manifestations as tabes dorsalis; perhaps no other affection of the body assumes so multifarious forms, and the experience of my own practice is that in no other condition is my help in diagnosis more frequently asked by general practitioners and by other specialists. I have consequently selected as my subject some of the clinical manifestations of this disease, and will deal chiefly with those which offer difficulties in diagnosis. These are usually early or isolated symptoms. Time will, unfortunately, prevent any but a cursory reference to the pathology of the disease or to the pathogenesis of its symptoms, and even the question of treatment must be largely neglected, conscious though I am that to those engaged in the daily care of patients treatment must demand the foremost place in the discussion of any disease. My excuse is that in tabes diagnosis must precede efficient treatment.

Tabetic Pains.

Pains are notoriously among the earliest and most common symptoms, but they are by no means constant, for even the most careful questioning of some patients fails to elicit a history of any. There can be rarely any doubt of their origin when an accurate description of their nature is obtained, since the shooting, lancinating, or lightning pangs, or the sharp darting or burning stabs, often compared to red-hot needles, which shift from place to place, are almost typical. The difficulty in recognizing them occurs when their character or the description of them obtained is less typical, and especially when, being an early feature of the disease, it is for their relief only that the patient seeks our advice.

The proportion of early tabetics who first complain of "rheumatism," or, using the term made popular by the war, call their trouble "myalgia," is certainly considerable, and in many of these the knee-jerks are still present, the pupils react to light, and there is often no disturbance of gait. The features that should attract our attention are the reference of the pains to the muscle masses, or to the tissues between rather than around the joints, and the fact that they are usually neither excited, aggravated, nor otherwise influenced by movement or by pressure as rheumatic and myalgic pains are. Further, these early pains frequently occur in the trunk, where rheumatic pains are rare, or trunk pains appear simultaneously or alternately with limb pains.

In many cases where the pains are limited to a small region the diagnosis of "neuritis" is made, or they may be attributed to "sciatica" when they occur chiefly on the posterior aspect of the lower limbs. But if we have an intelligent patient, or can obtain an accurate history, it is usually easy to exclude a neuritis. In the first place the pains are rarely, if ever, limited to the distribution of the sciatic or any other nerve, and if they happen to be they spread over a small part only of its sensory area and do not follow its whole course; if they occupy the sciatic region they generally occur in other parts of the limb too, or in the opposite limb, or in the trunk, which is, of course, exceptional in sciatica. Further, in neuritis and sciatica the affected nerves are tender or at least sensitive to pressure and stretching, while in tabes they are usually completely or abnormally insensitive, as Biernacki pointed out.

It is, however, pains limited to certain regions that are most likely to confuse us or lead us into error. While the description of a typical girdle pain around the waist or thorax arouses our suspicions at once, we are more likely to overlook the origin of a pain which is more or less constant and fixed in one side of the abdomen or chest, seeking its explanation in some disease or disturbance of the underlying visceral organs. But such local pain is common in tabes, and is often an early symptom. Here again the nature of the pain and its distribution are valuable guides. As a rule the tabetic pain is not limited to an area on any aspect of the trunk as visceral pain usually is, or though it may be greater at one point it tends to spread around the whole distribution of those sensory roots to the disease to which it is due. But this is not always a characteristic feature, since girdle or semi-girdle pain is often associated with visceral disease; we are all familiar, for instance, with the pain which encircles one side of the lower thorax and abdomen in basal pleuropneumonia, and the radicular hyperaesthesia of Head and McKenzie associated with disease of deeper organs is often described as pain. The absence of evidence of such disease is, of course, an important point in diagnosis, but still more is the fact that in tabes the pain is not accompanied by those manifestations which one would expect were it due to an affection of a visceral organ. Pain referred to the abdomen, which we might attribute to the appendix or gall bladder, is, for instance, not associated with tenderness or resistance over these organs, and that in the thorax is not aggravated by deep breathing nor associated with limitation or alteration in the respiratory movements. Further, the patient's conduct and activity are not, as a rule, compatible with visceral disease of sufficient intensity to produce such pain, for the tabetic often continues to lead an active life, or shows at least little reluctance to move, though he complains bitterly of his sufferings.

The possibility of tabes must be therefore always considered when, on the one hand, movement or the functional activity of the organ suspected does not aggravate or increase in any noteworthy degree a severe and persistent pain, and on the other when pressure or handling of the parts to which it is referred has little or no influence on its severity. But caution is necessary in applying these tests, since the skin of an area where tabetic pains have persisted for some time often becomes unnaturally sensitive to certain forms of stimulation at least. It is most commonly excessively tender to moving stimuli, as to a hand or even a wisp of cotton-wool drawn over it, but then heavy pressure or a pin-prick may give no discomfort, or indeed less than it would on normal parts.

This observation leads us to the most important point in its differential diagnosis, which is that where tabetic pain has persisted for any considerable time there is a disturbance of sensation, most commonly a reduction of pain sensibility. The suffocating tightness around the thorax or the abdominal girdle pain occurs, as is well known, in areas of analgesia or hypalgesia, and the same general rule holds for pain of other distribution. It is, in fact, rare to find all forms of sensation intact where pain is severe, except in a small proportion of those cases in which it is recent.

These sensory disturbances are almost invariably the only objective or demonstrable changes associated with tabetic pains. Occasionally, though very rarely, the existence of pains in one region of the body is followed by changes in the skin; I have seen subepidermal haemorrhages in limbs that had been subject to prolonged local pains, and in one case repeated outbursts of herpetic vesicles. A local falling of hair and thinning and atrophy of the skin have been also described.

The frequency of local pains in the limbs, and particularly in the trunk, is generally recognized, but such local pains occurring in the head have attracted less attention. They are not prominent symptoms in a large proportion of the cases, but are yet sufficiently common to warrant notice. I have, for instance, seen more than once recurring tabetic pains in the cheek diagnosed and treated as trigeminal neuralgia, and one of my patients had even undergone alcohol injections for this condition, though careful questioning would have revealed the true state and obviated a therapeutic failure. But more common than facial pain is pain of either sharp and stabbing or dull and aching character, limited to or most pronounced in the occipital region of the scalp; it is therefore likely to be confused with occipital neuralgia. When an isolated complaint the origin of these pains may not be easily recognized, but a careful history generally discovers the existence at some time or other of more or less similar pains elsewhere, and examination brings to light other signs of the disease, for these facial and occipital pains are rarely early or isolated symptoms. When tabes is suspected their nature can be assured by even a cursory examination of sensation, for, as is the rule elsewhere, pain sensibility is absent or diminished where they occur, though tactile and probably other forms of sensation are intact or little disturbed.

Not infrequently it is not for the relief of pains that the patient consults us, but owing to the existence of an unnatural sensitiveness or tenderness of some part of his body to stimuli

which normally give little or no discomfort. Those accustomed to the routine examination of patients with nervous complaints are familiar with the excessive reaction and violent expostulations that even gentle scraping of the soles in eliciting the plantar reflex may evoke in a tabetic. Sometimes there is a similar hyperaesthesia to other stimuli, as the rubbing of the clothes on the trunk and limbs. Unnatural sensitiveness to thermal stimuli, and especially to cold, is more common. The touch of a cold hand may be resented, and a few drops of cold water sprinkled on the trunk, particularly on the back, may evoke intense burning or stabbing pains. This is occasionally one of the first symptoms of the disease. I lately saw a doctor suffering with tabes who discovered three years before any other symptoms appeared that he could no longer swim or take a cold bath, since immediately the water reached his waist he experienced what he described as "an awful feeling as if his body were being cut through by red-hot knives." Some of these patients come under observation complaining of rheumatism or neuralgic pains, which are excited or aggravated by a draught of cold air or by contact with any cold object.

Paraesthesiae.

Another important group of symptoms are the various paraesthesiae so common in tabes. Sometimes it is a complaint of numbness or loss of feeling; sometimes it is of a "uselessness" of the hands or feet, to employ a vague description often used by the patients; more rarely it is a distressing sensation of either heat or cold, or a feeling of dampness or wetness of some part. The difficulty in recognizing the nature of these symptoms is due mainly to the fact that objective changes corresponding to the loss or perversion of sensation of which the patient complains cannot usually be demonstrated by a casual examination. Though he may tell us that he does not feel the ground properly under his feet, that it seems to him as if he were walking on air or on soft cushions, we may find tactile and perhaps other forms of cutaneous sensibility on his feet unaltered, and we may consequently conclude that there is no organic basis for his complaint. But, as Hughlings Jackson pointed out, the sensation of resistance or the recognition of the consistence of objects, as the hardness of the floor, depends not on cutaneous sensation but on those afferent impressions which arise from the deeper structures of the limbs, especially from the muscles and tendons. The feeling of "uselessness" in the hands also is due mainly to disturbances of the sense of position, or of the power of recognizing the form and weight of objects handled, rather than to loss of cutaneous sensibility.

There is often, however, some disturbance of skin sensation too. In a patient under my care one of the first symptoms was inability to "feel" his billiard cue properly, which seemed at first inexplicable, as tactile, pain, and thermal sensibility on his fingers were intact. Later the "loss of feeling" increased so much that he had to cease dining out since he could not use his knife and fork properly, and since he could not "feel" the coins in his pocket he could take a taxi only when accompanied by a friend; but still there was little or no insensitiveness of the skin to the ordinary tests. A more complete examination revealed, however, great impairment of the sense of position in his fingers, and that he was unable to recognize accurately the shape, size, and weight of objects placed in his hands. Since it is to disturbances of these qualities of sensation that similar disorders are due in other spinal and cerebral diseases as well as in tabes, a careful investigation, particularly of the sense of position, is essential in attempting to elucidate their nature.

This numbness or subjective loss of feeling is occasionally found in unexpected parts; I have seen a few patients whose chief complaint was that their penis and scrotum felt numb or dead, and in one man at present under my care the most distressing symptom is that he has no feeling in his lips and cheeks.

Tabetic Crises.

Next in order after pain it is the tabetic crises that are most likely to offer difficulties, or to lead us into error in diagnosis. We are all familiar with the patient on whom perhaps several abdominal operations have been performed without giving the promised relief. I recently saw two patients on successive days, one of whom had undergone four and the other five abdominal explorations for attacks of acute abdominal pain and vomiting. The appendix or the gall bladder may be suspected, or the symptoms may suggest perforation. A neurologist may easily exaggerate the frequency with which this mistake is made, but that it is not uncommon is shown by the experience of an American colleague lately working with me. He obtained permission to investigate patients on whom abdominal operations for acute symptoms had been recently performed in several general hospitals, and he discovered among them a proportion of tabetics subject to gastric crises much larger than I would have believed possible. Gastric crises probably occur in about 10 per cent. of all tabetics.

Here, as is the case in tabetic pains, the errors in diagnosis can be attributed largely to the fact that these crises are frequently early symptoms, and are often not accompanied by those signs that are commonly held to be characteristic of the disease. Many patients, in fact, state that apart from the abdominal attacks they enjoy perfect health.

We can as a rule gain little information of value from the patient, as the pain and the character of the vomiting resemble closely those due to intra-abdominal conditions. The pain, which generally precedes the vomiting, commences in the epigastrium, but later radiates into the back and spreads throughout the whole abdomen and into the loins; it is usually of an intense burning or violent cramp-like character, and is generally accompanied by sensations of constriction or distension. The vomiting which soon sets in may be more or less continuous for days, and may or may not be associated with nausea. The points which should arouse our suspicions that the pain and vomiting are of nervous origin are, in the first place, the history that similar attacks have occurred before, each of which ceased more or less abruptly and left the patient in apparently perfect health. But this is not a pathognomonic feature, since renal and biliary colic may also recur between periods of normal health, and it is when we are so unlucky as to meet with a patient in the first crisis that our difficulties are greatest. In the second place the most striking feature of a tabetic crisis is that, though the patient vomits incessantly and gives evidence of the most intense pain, the abdomen between the bouts of vomiting is lax, or at least not so resistant as it would be with an acute visceral lesion, and handling or palpation does not notably increase or excite the pain. But here too we must be on our guard, since the vomiting is often accompanied by intense hyperaesthesia of the skin; the first touch of the hand, and particularly gentle stroking, may evoke at once great discomfort and excite a reflex contraction of the muscles. But when the hand is laid firmly on the abdomen this tenderness disappears, and deep palpation can be often carried out without discomfort to the subject and without exciting muscular contractions; this is the most valuable diagnostic feature of tabetic vomiting.

Not infrequently patients complain not of the characteristic paroxysms of pain and vomiting, but of a constant nausea or aching in the region of the stomach. In these the symptoms are likely to be treated as merely manifestations of dyspepsia, but it is usually found that neither the nausea nor pain bears any relation to food, and that they do not yield even temporarily to change or restriction of diet, or to those drugs by which we treat dyspepsia or the conditions to which it is ordinarily due. Further, the appetite usually remains surprisingly good despite the discomfort, and there are no objective signs of gastric disturbance.

Laryngeal crises are probably the next most common variety. They, too, may give rise to errors in diagnosis. The most common form begins with tickling or a feeling of constriction in the throat, followed by a violent paroxysm of coughing, accompanied in severer attacks by dyspnoea and stridor, continuing till the patient becomes asphyxiated or even semi-conscious. An accurate description will probably indicate their nature at once, but unfortunately accurate descriptions, unless we elicit them by adequate questioning, are not common. The patient's complaints may consequently suggest either a local laryngeal disturbance or an attack of asthma; the latter is likely to be suspected, since laryngeal crises occur most frequently at night. Unless the signs of tabes are sufficient to attract attention or to indicate the diagnosis the conclusion must be based on negative rather than on positive evidence. Laryngoscopic examination reveals nothing to account for the attacks, or at the most an abductor palsy, while examination of the chest shows none of the signs usually associated with asthma.

Rectal crises, characterized by paroxysms of local pain, with distressing tenesmus, and often with the sensation of a foreign body in the rectum, are rarer, but I have seen them give rise to serious mistakes in diagnosis. Here, again, the absence of signs of local disease, the persistence of the symptoms over long periods, and the fact that the pain often

radiates more widely into the perineum and surrounding parts than it does in rectal affections, must put us on the search for a nervous origin of the complaint.

Bone and Joint Lesions.

The next group of symptoms that are perhaps most important to those engaged in the general practice of medicine are the bony and arthritic lesions which are so common in tabes. Fractures of the long bones, especially of the femur, may occur as a result of a trivial injury, or even of muscular action. The fact that there is often little or no pain may lead to failure to detect the true nature of the condition, and the difficulty in obtaining proper union may be, in the light of recent legal decisions, a serious matter for the surgeon who is so unlucky as to meet such a case. I obtained recently an autopsy on a woman whom I had followed for several years. About twenty years ago she slipped in the street, and, being unable to rise, was taken into hospital. There a fracture of the right femur was detected, and, according to her own story, the left femur was inadvertently fractured too, during the manipulations to set the broken limb. As a result she never rose from bed again. At the *post-mortem* examination I found both femora fractured, the broken ends widely separated and eroded, and enclosed in dense fibrous cysts. These fractures often occur under unsuspected conditions. Several years ago, while resident in a hospital, I was asked to see a charwoman employed there, who, while at her work immediately before, suddenly developed an enormous swelling of the right shoulder, with subcutaneous haemorrhage, which eventually tracked over that side of the thorax and down the arm. Examination revealed a fracture of the upper end of the humerus, which had apparently occurred without any pain; the haemorrhage was probably due to the jagged end of the broken bone having torn one of the large vessels in its neighbourhood. This woman's husband had died with tabes several years previously, but she had believed herself in good health, and even questioning failed to elicit any previous symptoms of the disease apart from a little "rheumatism."

The arthropathies are much more common, and are often the first symptom that brings the patient to notice. It is unnecessary to refer to the more or less characteristic features of these lesions, which were so accurately and vividly described by Charcot, but there are a few points in connexion with them which are of general interest. The first is their relation to injuries often so slight that they are disregarded by the practitioner who is called in, though emphasized by the patient, who is always on the look-out for an extraneous causal factor for his troubles. A slight strain at the knee or ankle is followed by a more or less painless swelling which persists longer than the nature of the injury appears to warrant, and is succeeded by disintegration of the joint, laxity of its ligaments, and the well-known deformities. It is often only when this stage is reached that the real nature of the condition is recognized. In fact the only feature which, as far as I am aware, may in the early stages excite suspicion is the painlessness of the swelling, but even this is not pathognomonic. Arthropathies in the limbs are generally easily recognized, but those which occur elsewhere may escape detection. A few months ago, for instance, a man was sent to me owing to a swelling in his lumbar region which obviously involved the spine. A vertebral tumour was suspected, the existence of which would have explained the absence of his knee-jerks, as the lumbar roots would have been certainly involved. It was only further examination of the patient which showed he was suffering with tabes, and the painless nature of the deformity then made diagnosis clear.

The arthropathies sometimes follow more serious injuries. Some time ago I saw a woman who, while in apparently good health, had twelve months previously sustained a Pott's fracture of her left ankle owing to a fall. The bones did not unite as would have been expected, and the swelling about the ankle-joint increased rather than diminished. When I saw her there was a typical Charcot lesion with considerable absorption of the lower fragment of the tibia and disintegration of the joint.

Among the so-called trophic disturbances the painless chronic and indolent perforating ulcers which occur on the soles need no comment; the only other condition in which they are commonly seen is diabetes, but they are in this disease, in my experience, usually associated with more pain or discomfort. It is, however, worth while bearing in mind that they are not limited to the sole; I have seen one on the stump that bore an artificial leg, and one on the inner side of the cheek where a denture rubbed. Falling of the hair is less common, but lately a man under treatment for alopecia was referred to me as he complained of rheumatism; examination showed he was a typical tabetic who had almost suddenly and without apparent cause lost all his hair. Rapid loosening and falling out of the teeth is also sometimes seen.

Sphincter Disturbances.

The sphincter disturbances of tabes are another pitfall to the unwary. We all recognize the frequency of either retention or incontinence of urine in the advanced stages of the disease, but often forget that these may be among its earliest manifestations. Not infrequently I see patients who have been under treatment for local vesical troubles, or who have even undergone operations; it is consequently worth our while to consider shortly the more common forms that these bladder symptoms assume. The earliest change is generally slowness in starting the flow of urine; the patient has to wait an unnatural time before the urine comes and may have to use accessory means, as pressure over the bladder, to start it. Further, the bladder is often not completely emptied, so that a considerable amount of residual urine may be found immediately after micturition. In a man over middle age these symptoms may, of course, suggest an enlarged prostate or a stricture. Frequently occasional incontinence occurs at this stage too, the urine dribbling away in a few drops at a time, especially at night or on a sudden exertion, often unperceived by the patient, since the urethra and penis may be anaesthetic. In other cases there is a chronic distension of the bladder which may be unnoticed, since it is frequently insensitive to that degree of tension which normally produces pain or discomfort.

Rectal troubles are less common, but I have seen incontinence occur as an early symptom, occasionally the passage of faeces not being noticed by the patient owing to the anaesthesia of the anal region. As the sexual power is generally lost in males early in the disease, the possibility of tabes must be also considered in every case of impotence. Since the sexual appetite usually disappears at the same time it is not a matter of such distress and worry to the tabetic as impotence due to other causes usually is.

Ocular Symptoms.

One other group of symptoms to which I shall refer are the ocular troubles which occur so frequently in the course of tabes. Certainly the majority of patients afflicted with this disease have at some time or other during its course diplopia due to paresis of one or more of the ocular muscles. The external rectus is the muscle most commonly involved, especially in the early transient palsies, and next in frequency those supplied by the oculo-motor nerve.

There is nothing characteristic in either the form or course of these ocular palsies, and their origin can be consequently determined only when the disease is diagnosed. In many cases they are transient, disappearing within a few days or weeks; in others they are permanent and resistant to treatment of every form. Frequently the degree of dislocation of the visual axes is so slight that no squint can be observed, and the patient may complain of blurred or indistinct sight rather than of double vision. This is occasionally a source of confusion, since a disturbance of refraction may be suspected, or, the sight of each eye alone being good, the origin of the defect may be obscure.

Ptosis, or drooping of the eyelids, may, of course, result from a lesion of the trunk of the oculo-motor nerve, or it may appear as an isolated symptom apart from palsy of any of the external ocular muscles. It is on the latter variety that I wish to lay emphasis, since it is an important diagnostic sign. There are, in fact, few cases who do not present it in some degree. The upper lids droop equally, or the one perhaps more than the other, but at first they rise to the full extent, or almost so, when the patient looks up. In order to compensate it the frontalis muscle is permanently contracted, and the forehead is therefore wrinkled. Largely to this is due the "tabetic facies" by which many cases can be recognized at the first glance; other factors in this typical appearance are the small pupils and the curious moist glistening eyes. So characteristic is this facies that one familiar with it can almost always pick out tabetics lying in a ward with, or sitting among, other patients.

It is also necessary to insist that though failure of the pupils to contract to light is regarded as one of the most characteristic signs of the disease it is not invariably present

in tabes, nor is it the only pupillary anomaly that occurs. The Argyll Robertson sign—that is, miotic pupils which fail to react to light but contract on accommodation—is probably seen in not more than 60 per cent. of the cases. In others the pupillary apertures may be normal in size, or those of the two eyes may be unequal, and not infrequently the pupils fail to contract on convergence too. In the latter case there is often a disturbance of accommodation; being a physician to a large ophthalmic hospital I often see patients complaining of defective vision due to palsy of accommodation, in whom examination reveals no cause other than tabes.

It must be borne in mind that though tabes is the condition in which the Argyll Robertson phenomenon is most commonly seen, it is not pathognomonic of this disease. There can be no doubt that it may result from local lesions of the mid-brain, and that it occurs occasionally in syphilitic subjects who never develop tabes; according to some authors it is found in uncomplicated cases of chronic alcoholism.

Finally, the frequency with which tabes is the cause of blindness or diminution of vision due to primary atrophy must not be forgotten. At the Royal London Ophthalmic Hospital a large number of cases with diminishing vision and the ophthalmoscopic appearance of primary optic atrophy are referred to me, and in a considerable proportion of these the neurological diagnosis is tabes. That the proportion is really larger than the physical signs at the moment of examination indicate I have no doubt, since the onset of blindness is frequently the first and the only sign of the disease. It is therefore worth bearing in mind that about 20 per cent. of all tabetics develop optic atrophy, and that tabes is a very common disease. Consequently, we can never afford to neglect the possibility of tabes in any patient who in adult years complains of failing sight.

DIAGNOSIS OF TABES.

As we have not considered some of those symptoms of tabes that may present difficulties in diagnosis, we must turn to the means by which diagnosis can be most accurately made.

The first question that arises is, What is tabes? Are we justified in making this diagnosis in patients with isolated symptoms, each of which may be due to other causes?—when, for instance, a man complains of pains in his legs and examination discovers only diminution of one knee-jerk; or when another has a primary optic atrophy and gives a history of transient diplopia, but presents none of the other so-called cardinal signs; or when Argyll Robertson pupils are the only demonstrable abnormality; or when we find a painless, swollen, and disintegrating joint, and loss or diminution of some of the reflexes. It may be easy to answer this question in any specific case, but it is certainly difficult to make a general rule. Even the pathological and serological tests are not conclusive, as they often are negative in patients with characteristic symptoms, and especially in slowly progressive cases in which the symptoms are not typical. Indeed, a positive Wassermann reaction is obtained in the blood in not more than 65 per cent. of all cases, and it may be negative even in the cerebro-spinal fluid, and the latter may show no other pathological changes in 20 per cent. If we therefore rely on the clinical pathologist we are liable to an error of 1 in 5 at least.

A short review of the pathology of the disease may help us. The most obvious anatomical change is a degeneration of the posterior columns of the cord. The older views that this is the primary lesion have been conclusively disproved, and all are now agreed that the spinal degeneration is secondary to disease of the posterior roots. But the nature of this primary affection is not yet conclusively settled. According to one hypothesis it is a primary degeneration of the fibres of the posterior roots due to the selective action of a syphilitic toxin upon them; according to another the main factor is injury of the roots by an overgrowth of connective tissue which surrounds and constricts them. All recent evidence points to the latter hypothesis as being the more probable. Some years ago Nageotte insisted that the essential lesion is to be found where the posterior root joins the anterior root before they reach the ganglion. This portion, which he calls "*le nerf radiculaire*," is surrounded by a sheath of the arachnoid, and, according to him, in suitable cases it may be shown that the changes commence in the subarachnoid tissue around this portion of the root; they consist in the proliferation of granulation tissue, which, partly by interfering with the nutrition of the nerve fibres, partly by mechanical constriction of them, leads to their degeneration. Nageotte's findings have been lately confirmed by Richter, who has in addition demonstrated the presence of spirochaetes in this arachnoid funnel.

Whether this theory of Nageotte and Richter ultimately proves to be true or not, there can be no doubt that the essential lesion of the disease is a degeneration of the posterior roots, and consequently the most constant and characteristic symptoms should be disturbances in the functions of the afferent systems. The knee-jerks and other reflexes depend on the integrity of this, and they are consequently usually absent in the advanced stages of the disease. But this is by no means so in the early stages, and in many cases they certainly persist for years after unequivocal signs have appeared. Further, Romberg's sign is by no means constant, especially in the early part of the disease when diagnosis is most important. Even the pupillary reflexes are often normal or the reactions are anomalous, and in quite a large proportion of all cases gait is never affected. We thus find that all the cardinal signs on which the ordinary textbooks of medicine lay so much stress may, like the clinical pathologist, leave us in the lurch.

When, however, we turn to the examination of sensation we find, as we might expect from the pathological site of the disease, that there are very few if any cases in any stage in which there are no sensory changes. But a complete examination of sensation is extremely difficult and time-consuming, and there are but few competent either by training or experience to carry it out. Further, the character and form of the sensory disturbances vary enormously from case to case. We must therefore for clinical purposes select tests that are simple, reliable, and practicable. And this is luckily possible, for the most constant and characteristic changes are in sensibility to cutaneous pain.

When sensation is tested with the point of a sharp steel pin or needle widespread disturbances are usually found even in the early stages of the disease. But even this simple test requires some care, as the insertion of a pin-point evokes, in addition to pain, an idea of sharpness by which the stimulus can be often recognized in analgesic areas, and unintelligent patients may consequently make replies that confuse the observer. This difficulty is obviated by placing the point of the pin against the tip of the observer's index or middle finger and pressing with the finger on the skin as the pin penetrates it; then the patient can be asked to reply whether each contact is only a touch, or if there is a prick as well.

The earliest loss of sensibility to pin-prick is usually found on the lower extremities; it is most marked on their distal segments, and diminishes gradually in intensity towards the groins. It does not as a rule correspond to root distribution; it may, for instance, be slight or absent on the thighs and buttocks though considerable in degree in the legs, which are innervated by the same sacral and lumbar roots. Sometimes, however, it follows the lines of the cutaneous root areas.

At first the loss is only partial—either the pain evoked by the stimulus is less than a prick produces elsewhere, or more commonly only a certain proportion of pricks of moderate intensity, but sufficient to cause pain in normal persons, are recognized. As the disease advances this hypalgesia becomes more intense. Not uncommonly patients appreciate no discomfort from a pin-prick on any portion of the lower limbs, or only in the upper thighs, but before this stage is reached certain anomalies of sensation are often present. There may be a delay in the perception of pain, or the prick excites abnormal sensations, as burning or tingling, or the pain persists unnaturally, so that the patient commonly attempts to "rub away the feeling."

Even more common than disturbance of pain sensibility on the legs is the zone of analgesia around the trunk, to which Laehr first drew attention. The upper margin of this zone generally lies at the level of the second ribs in front where the areas of the cervical and dorsal roots meet; it may extend downwards only a few inches or as far as the groins. As a rule the hypalgesia is most intense between the second ribs and the nipples, while the zone around the trunk immediately above the groins and buttocks is that which generally escapes longest. The loss of pain sensibility in this trunk zone is usually more profound than on the legs. When it is only partial it can be easily demonstrated by making a series of pricks from below upwards towards the clavicles or on to the neck.

Another common area of analgesia is the ulnar borders of the arms, but this usually appears later in the disease. It is variable in extent, and may be represented by a narrow

band in the inner border of the forearm, or may comprise the whole ulnar half of the limb, including the two or three ulnar fingers. Here too, as on the legs, the analgesia is rarely complete, and is often represented only by a relative insensibility as compared with the radial borders of the arms.

Duchenne observed many years ago that the face is occasionally analgesic in tabes, or rather that portion of it which is supplied by the trigeminal nerve. He spoke of this trigeminal loss as "*le masque tabétique*," but a complete mask is rare. Some diminution of sensibility to pin-prick is, however, extremely common on an irregular area in the centre of the face, especially on the nose and the neighbouring portion of the cheeks. It is an important symptom, as sensory loss of this distribution is not found in any other nervous disease, except perhaps leprosy. It is easily demonstrated, for probably on no part of the body is the prick of a sharp pin so painful as on the nose and adjoining portions of the cheeks, and it is exactly here that sensibility is often lost or diminished in tabes. The area affected may vary from a small patch on the nose to the greater part of the face, until indeed it forms a typical tabetic mask. If slight it may be apparent only when the sensibility is contrasted with that of a normal area, as on the neck.

The diminution, loss, or alteration of sensibility to pin-prick in some or all of these areas—that is, the distal portions of the lower limbs, the thoracic zone, the radial borders of the arms, and the central portion of the face—constitutes the most common, the most definite, and the most characteristic physical sign of tabes dorsalis. It is frequently present when the knee-jerks and the pupillary reactions are normal and before ataxia or other symptoms develop, and it is consequently a most important phenomenon in the diagnosis of the disease. The loss of sensation in these areas is a dissociated one—that is, its different modalities are affected in different degrees, or some forms only may be disturbed. Touch, for instance, is frequently intact on the chest and face at least, and the affection of thermal sensibility is inconstant and irregular. Its diagnostic value is enhanced by the fact that in no other disease is there dissociated analgesia of a similar distribution.

Though I lay so much weight on the presence of this cutaneous analgesia as a diagnostic sign owing to its constancy and the simplicity with which it can be demonstrated, I do not wish to underestimate the importance of other sensory disturbances. Tactile sensibility is rarely profoundly affected, but is often reduced, especially on the legs. Thermal sensibility is more irregular, and as the sensations evoked by the contact of hot and cold test objects may be perverted rather than reduced, its investigation is too difficult for ordinary clinical purposes. On the other hand, though changes in so-called deep sensation—that is, the sense of position and movement, the recognition of size, shape, and weight, and the appreciation of vibration—are certainly the most important in the pathogenesis of the symptoms of the disease, their investigation requires more care and skill, and disturbances in them are much less constant in the slighter cases and in the early stages.

Few diseases are so protean and irregular in their manifestations; few, if any, present so many symptoms that may lead us into error in diagnosis and prognosis, and few require in their early stages so much care in investigation and treatment. I have endeavoured to put before you some of the pitfalls that await us, for consciousness of danger is our surest safeguard, and to point out the simplest means by which, in my experience, we may avoid mistakes.

THE question of indirect advertising has been occupying the General Council of the Bar. The annual report for 1922 states that the attention of the Council was called to an article, which appeared with sensational headings in a Sunday newspaper, purporting to be written by a leading counsel. When asked for an explanation, this gentleman stated that the managers of the paper had pressed him to see a reporter and to give him his views on a legal subject. After several refusals the counsel ultimately acceded to the request, warning the reporter that the interview was not to be used in any way that might be regarded as advertising himself. The interviewer apparently worked up the conversation into an article, which appeared under the name of the counsel as if it had been actually written by him. Eventually the managers of the paper expressed regret for what had occurred. The General Council of the Bar, with a view to avoiding possible misunderstanding in the future, has passed the following resolution: "That it is contrary to the etiquette of the Bar for a practising barrister to give an interview to a representative of the press on any matter in which he has been or is engaged as counsel."

SOME APPLICATIONS OF PHYSIOLOGY TO MEDICINE.

I.—SENSORY PHENOMENA ASSOCIATED WITH DEFECTIVE BLOOD SUPPLY TO WORKING MUSCLES.

BY

J. A. MACWILLIAM, M.D., F.R.S.,

PROFESSOR OF PHYSIOLOGY,

AND

W. J. WEBSTER, M.B.,

ASSISTANT IN PHYSIOLOGY, IN THE UNIVERSITY OF ABERDEEN.

(From the Physiological Laboratory.)

ACCURATE knowledge of the effects of defective blood supply to the various tissues and organs is obviously of great importance in view of the innumerable conditions of stress, derangement, and disease in which this factor comes into play, with manifold results in the way of disturbed or impaired functions in the different systems of the body. "Defective supply" naturally covers different conditions—quantitative deficiency in normal constituents, or the presence of abnormal and injurious constituents, or inadequacy as regards the volume, pressure, and rapidity of flow of normal blood. This communication deals with the last-named—certain effects of deficiency in the supply of normal blood to normal muscles.

Many impairments of functional activity from more or less extensive interference with blood supply have long been known, such as the weakening of the heart muscle from deficient coronary supply and the common occurrence of fibrillation after sudden coronary obstruction; the effects on the brain in the form of giddiness, faintness, or loss of consciousness; and the primarily exciting and secondarily depressing influences exercised powerfully on the medulla (respiratory, vasomotor, and cardio-inhibitory centres, etc.) and on the spinal centres from sufficiently extensive or sudden acute lack of blood supply; also the derangement or stoppage of kidney function from similar interference.

Various observations are on record dealing with the functional behaviour of excised organs and muscles artificially perfused with blood or in the exsanguine condition, and also observations on the effects of artificial interference with the blood supply of organs and muscles *in situ* in animal experiments. Under such conditions there is of course no information obtainable as to sensory phenomena attendant on altered blood supply in the conditions of rest and activity.

The present inquiry deals with the behaviour of human muscles temporarily deprived of their blood supply while their normal innervation remains intact; the sensory phenomena recognizable in the states of rest and activity are examined and brought into relation with other functional conditions, such as changes in contractile power, etc.

Methods of Experiment.

The forearm was investigated (*a*) while the normal circulation was going on, and (*b*) when the blood supply was stopped, the limb either retaining its blood in a stationary condition or being rendered exsanguine before the circulation was arrested—that is, the "congested arm" and the "ischaemic" arm were examined with arrested circulation. The circulation was stopped by a blood pressure armlet applied to the upper arm, which was rapidly pumped up to a constricting pressure much above what was necessary to produce arterial obliteration in the particular individual examined—that is, an armlet pressure largely exceeding the systolic pressure. When this was done in the usual way, as for the measurement of systolic blood pressure, a "congested arm" was obtained containing a large amount of stationary blood shut off from the general circulation, the veins becoming prominent and tense. To obtain the bloodless or ischaemic arm an elastic bandage was first applied to the hand and arm, and removed after the armlet had been pumped up as described.

In the congested arm the sensory phenomena are naturally complex, being partly attributable to conditions attendant on the arrest of the circulation as influencing the muscles, etc., and partly to the discomfort caused by the venous turgescence. To avoid the latter complication the method of the ischaemic arm is employed; the sensations induced by muscular activity in presence of acute want of blood can then be examined.

Under these conditions muscular action was tested in various ways. Graphic records of the flexor muscle of the

middle finger were made by means of a Mosso's ergograph, the voluntary flexion movements being made in regular series—one in one second or in two seconds, etc.—timed by a metronome, while the weight lifted at each contraction varied in different experiments from 1 to 3 kg. The behaviour of the muscle in different conditions, the amounts of mechanical work done as measured in kilogram-metres, the development of fatigue, etc., were graphically recorded, while the sensations associated with different phases were noted. The results as regards fatigue, etc., will be described elsewhere, the present communication having to do with the sensory phenomena.

Another method is to use a series of grasping movements with the hand, bringing them to bear on a dynamometer or a dynamograph; this method is in some respects less precise than the preceding.

Another mode of experiment was to use the abductor indicis muscle, working against the resistance of a strong elastic band embracing the fingers; successive abduction movements of the fingers were then made in regular series; only the hand was rendered ischaemic in this case, the armlet being applied to the forearm. The hand was supported on a table with the palmar surface downwards. Graphic records can be obtained by making the movements of the finger inscribe on a moving smoked paper.

Ischaemia of the Resting Arm.

In observations made by these methods it was found that simple deprivation of blood in the ischaemic limb for periods up to twenty minutes caused no great sensory effects, only coldness in the bloodless part, with an inclination to shift the position of the limb, and a certain amount of discomfort from the continued constriction by the obliterating armlet; the absence of pain is to be noted.

Muscular Action in the Ischaemic Arm.

Muscular action in the ischaemic limb soon becomes painful, and when carried to the point of "fatigue" is acutely painful. "Fatigue" is indicated by inability to go on executing contraction movements even of greatly reduced range. This index of "fatigue" is convenient for comparing the state of matters in normal and ischaemic muscles, though it does not represent inability of the muscle to do more mechanical work in more favourable circumstances—for example, with less resistance opposing the contraction, a lighter weight to lift, etc. It is a useful index of the stage of enfeeblement of the voluntary contractile power with which the sensory manifestations in muscles under different conditions can be correlated. The actual time necessary to induce fatigue and the number of movements that can be executed prior to this point are of course largely influenced by the weight used; with a sufficiently light weight the movements can be kept up for hours without the occurrence of fatigue in the normal arm while the circulation is intact. Under normal conditions the phenomena of fatigue as shown by ergograph records are well known. The associated sensations as the fatigue point is approached take the form of a sense of increased effort being necessary to raise the weight even for a short distance, an increasing disinclination to go on making the successive efforts, aching or dull pain in the central part of the forearm, etc. We have often found a certain amount of local tenderness to pressure in the fatigued muscles, lasting for some little time after action has been discontinued.

In the ischaemic arm the fatigue point is reached much more rapidly, often in one-half or one-third the time needed in the normal arm, with a proportionate diminution in the number of contractions executed, the more rapid development of extensive weakening at a relatively early stage, etc. Pain develops and by the time the fatigue point is reached becomes severe; further efforts at contraction movements lead to distressingly acute pain and the desire for relief becomes urgent, while there is a strong disinclination to attempt further efforts.

Distribution and Characters of the Pain.

The pain is felt over the flexor aspect of the forearm and is most intense in the central part of the forearm; it is specially marked from wrist to elbow along the line of the flexor digitorum sublimis. It seems to be centred in the belly of the working muscle with a good deal of spreading, but there is, as a rule, no referred pain in more distant parts; in one subject pain in the palm of the hand was complained of. The pain goes on increasing progressively while contractile activity is kept up; there is no remission, as may sometimes occur markedly in the normal arm, where, working with a suitable load, decided aching may develop at a comparative early stage, to pass off more or less completely at a later stage.

It is to be noted that the pain, increasing to almost intolerable severity in some of these experiments, arises from exercise of a comparatively small amount of muscular tissue—the limited portion of the flexor muscle engaged in moving a single finger—in presence of an acute lack of blood supply, involving urgent want of oxygen (anoxaemia) and its consequences, with excessive accumulation of metabolic products, acids, and other bodies. The pain is no doubt protective in character, tending to limitation of effort and shielding the muscle from being spurred on to further and injurious activity. Discontinuance of further effort for short periods does not remove the pain, but it is almost immediately relieved—in a few seconds—by readmission of blood into the limb by removal of the obliterating pressure of the armlet. Contractile energy, on the other hand, recovers gradually and slowly; it takes some time to be fully re-established, and even then is apt to fail more readily than before on repetition of the experiment. It is evident that the pain and the depression of contraction force do not run parallel in the ischaemic arm.

Relation of Pain to Weakening of Contraction Force.

The conclusion just stated is supported by the fact that in the ischaemic arm the development of pain in the course of a successive series of contractions is much greater in proportion to the weakening of contraction force than in the arm with intact circulation; with an equally extensive cutting down of the energy of movement in the two types of arm, as shown by the ergograph tracings, there was sharp pain in the ischaemic arm at a stage when there was only a tired feeling with some aching in the normal arm; pain and weakening of contractile force were differently related to one another in the two cases.

It may be noted that in the normal arm slight aching or local tenderness may last for some little time after the exercise of the flexor muscle (as recorded by the ergograph) has been discontinued, while in the ischaemic arm the sharp pain disappears quickly on re-establishment of the circulation. There is reason to believe that in fatigue following severe muscular exertion under normal conditions (for example, football, etc.) the muscular aching and tenderness, felt for a considerable length of time afterwards, especially in individuals out of training, are dependent on a mechanism of production that is not identical with that of the pain caused by working an ischaemic muscle.

The production of severe pain from a small amount of skeletal muscle working with its blood supply cut off recalls the agonizing pain excited by excessive contraction of a small amount of unstriped muscle in a bit of bile duct in gall-stone colic, or of ureter in renal colic, etc. Of course it does not follow that the mechanism of pain production is similar in the two kinds of muscle—the unstriated and the striated.

Observations on the Abductor Indicis Muscle.

Experiments with the abductor indicis muscle gave results essentially similar to those described above. For example, in an experiment when a certain strength of elastic band was used to resist the abduction movement, a series of about 240 movements could be carried out in the normal state at the rate of one per second before the "fatigue" point was reached—that is, the point where any abduction movement failed to occur against the resistance of the band; this was attended by only slight discomfort and aching—where the latter was present at all. In the ischaemic hand the fatigue point was reached at about one hundred contractions—that is, in less than two minutes, as compared with four minutes in the normal state; this was attended by pain, which spread more or less over the dorsum of the hand, though most sharply felt in the working muscle. Stoppage of the efforts at abduction for a minute did not lead to removal of the pain, but the latter was promptly relieved by re-establishment of the circulation; contractile power recovered much more slowly, and was more easily fatigued subsequently. Some minutes later

the hand was again rendered ischaemic, and kept in that condition with quiescent muscles for ten minutes; the hand became cold, but there was no pain, simple ischaemia having, as described above, no appreciable effect in this respect. Abduction movements of the index finger were then performed as before; there was painful fatigue after about sixty-five movements; the pain was removed as before by readmission of the blood. The usual well-known flushing occurred after the period of ischaemia; sensations of tingling gradually developed somewhat later.

Effects of Continuous Muscular Tension.

Experiments were also performed with the middle finger flexor muscle kept voluntarily contracted to sustain the ergograph weight at a certain level instead of making a series of consecutive lifting efforts as already described; graphic records of the behaviour of the muscle were made. Continuous motor effect failed to preserve the initial level beyond a certain time, which varied according to the weight employed, etc.; then came a general progressive decline, varied by minor irregularities in the slope of the tracing, until after a time the weight sank back to the resting position. This "fatigue" is attended by comparatively little subjective disturbance, even in the ischaemic arm. There was disinclination to keep up the tension of the muscle, which seems to need more and more voluntary effort, with some discomfort and aching—the latter felt chiefly in the upper arm and the finger—probably attributable not to the muscle itself but to the mechanical conditions connected with the fixed position of the limb and pressure on the skin of the finger by the loop at the end of the cord which supports the weight. There is evidently a notable difference as regards pain production between an alternately contracting and relaxing muscle doing mechanical work and the condition of sustained tension necessary to maintain the weight at certain levels. Similar results were obtained with the abductor indicis.

Relation to Pains of Angina Pectoris, Intermittent Claudication, etc.

It need hardly be pointed out that the foregoing observations have a close bearing on the problems associated with the production of the pain of angina pectoris, showing as they do how readily acute pain can be excited in skeletal muscle working with lack of blood supply, the pain developing while the contractile power, though to some extent weakened, is still sufficient to execute movements of considerable range and energy—that is, long before complete fatigue.

There is every reason to believe that processes of the same nature, with a similar production of pain of varying grades of severity, up to the agonizing suffering of fully developed angina, occur in cardiac muscle compelled to work with a blood supply that is inadequate—absolutely or relatively to the amount of work which the arm has to perform. Sir James Mackenzie has emphasized the conception of anginal pain as an expression of exhaustion of the cardiac muscle, commonly associated with a defective coronary blood supply and a susceptible nervous system. He has laid stress on the production of the symptoms of heart failure—pain, breathlessness, giddiness, faintness—as expressions of impaired functions of organs which fail to receive a blood supply adequate to the needs of their normal activities in consequence of a defective output of blood from the heart, the latter itself suffering from insufficient blood supply to its muscular walls; heart failure is thus recognized, not by direct examination of the organ itself, but by the functional effects of diminished blood supply to various organs.

It may be added that the results of the present experiments have an obvious application to the phenomena of the condition called "intermittent claudication," as seen in the legs of men and horses, in which muscular exertion is interrupted by attacks of pain, loss of power, coldness of the limbs, etc. These symptoms can be definitely explained: in consequence of blocking of the main artery, or disease or spasm of the vascular walls, the blood stream has been reduced to such an extent that, while it may suffice to supply the muscles in the resting state, it is quite inadequate for their greater requirements during activity—the results (pain, etc.) of the defective blood supply are of the same nature and mechanism of production as those demonstrable in the ischaemic arm of the healthy subject.

THE CLINICAL, PATHOLOGICAL, AND RADIOLOGICAL ASPECTS OF INFECTION OF THE TEETH AND GUMS.*

BY

SIR WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P.,

PHYSICIAN TO ST MARY'S HOSPITAL.

Historical.

SEPTIC absorption from the teeth and gums must date from the earliest period of man's history, for the examination of ancient skulls shows that dental sepsis has ever been present. The clinical symptoms resulting from infection of the teeth and gums must have afflicted the human race during its whole existence, and it is very remarkable that the causation of these symptoms escaped recognition for so long a period. The recognition of the clinical symptoms resulting from oral sepsis is quite modern.

Disease of the teeth and gums was described by H. A. Fauchard in 1740, and from that date much has been written on the subject. In 1875 John T. Riggs gave a full description of the disease in an address read before the American Academy of Dental Surgery on "Suppurative inflammation of the gums and absorption of the gums and alveolar process," and the disease "pyorrhoea alveolaris" is often called "Riggs's disease."

The next advance in knowledge resulted from the development of bacteriology and its application to the investigating of the varieties of organisms causing dental sepsis. Galippe and Professor Miller did valuable pioneer work in this respect from 1884 to 1894. The work of Pasteur and Lord Lister on the great influence of bacterial infection in the causation of disease prepared the way for the recognition of the far-reaching effects of the toxic absorption resulting from the organisms found to be associated with dental infections.

Dr. William Hunter, a distinguished Fellow of this Society, was the pioneer amongst physicians in recognizing "the relation of dental diseases to general diseases," and he read an important paper bearing this title before the Odontological Society of Great Britain in 1900. It is not too much to say that the appreciation to-day of dental sepsis as one of the commonest and most important causes of general diseases is very largely due to the unceasing and untiring work of Hunter in this department of medicine.

The Bacteria Causing Infection of the Teeth and Gums.

Professor Miller of Berlin in 1900 carried out a series of brilliant researches on the bacteria found in connexion with dental infections. He found no less than twenty different bacteria in twelve cases of pyorrhoea; amongst them were streptococci, staphylococci, bacilli of various kinds, and leptothrix. Recently,[1] J. McIntosh, Warwick James, and P. Lazarus-Barlow have isolated a bacillus which they believe to be the cause of dental caries and have named *Bacillus acidophilus odontolyticus.*

In this discussion we are mainly concerned with the organisms occurring in dental infections, the absorption of which, or their toxins, gives rise to general disease. There seems to be no doubt that it is the streptococcus infections which are almost entirely responsible. The streptococci found in mouth infections are usually classified into three groups, from their behaviour when grown on media containing blood.

1. *The Haemolytic group* cause severe toxaemia, and are found in the anaemias resulting from dental sepsis.

2. *The Viridans group* includes those streptococci which are associated with rheumatic affections. *Streptococcus salivarius* and *S. faecalis* belong to this group. They are both toxic, producing general toxaemic symptoms, and may give rise to arthritis, fibrositis, and other rheumatic affections. Arthritis and cardiac lesions have followed the inoculation of rabbits with the living organism in either case. Each of them has been found in malignant endocarditis.

3. *The indifferent group of Streptococci* are not toxic to guinea-pigs, and their association with rheumatic conditions is doubtful.

4. *Gram-negative cocci* are found associated with dental infections, but they are not usually toxic, and some of these types have probably been described as staphylococci in earlier writings.

* Paper read to open the discussion held at the Medical Society of London, December 11th, 1922.

5. *Staphylococci* are not usually found in dental infections, but often in the post-nasal space.

In the infections of the teeth and gums the same streptococcus is not necessarily found in different cases, nor can the local disease be constantly transmitted from an infected patient by inoculation of the healthy gums of another person; so that Koch's postulates of a specific infection are not satisfied. The infecting organisms are variable and the infection may be mixed, so that the problem of dental sepsis is a complicated one.

Evidence for the Conclusion that the Teeth and Gums are the Source of Infection.

It must not be hastily assumed because a patient is suffering from symptoms such as arthritis, fibrositis, anaemia, or some affection which is commonly associated with dental sepsis, that the teeth are the cause of the illness. Every case must be approached with an open mind and no preformed opinion.

There are many other foci of infection which may produce diseases identical with those resulting from dental sepsis; in other words, a streptococcal toxaemia may be due to a great many causes other than dental. Thus the tonsils, the nasopharynx, the intestine, and the urogenital tract may all be foci of infection for pathogenic streptococci or other organisms. Careful examination should always be made to determine if these other foci of infection may safely be excluded.

The practice of extraction of apparently healthy teeth merely because a patient is suffering from a disease which is often due to a dental infection cannot be too strongly condemned. There should always be strong evidence that the teeth are primarily and directly responsible for the disease in other organs before their extraction is justifiable.

The Signs of Unhealthy Conditions of the Teeth and Gums.

The presence of gingivitis is shown by an unhealthy spongy condition of the gums, which bleed readily and have a congested free marnin. Often congested hyperplastic projections occur between the teeth. These are particularly well marked in scorbutic conditions and have been described as "buds." Tartar and dirty collections may be present between the free surface of the gums and teeth. Pressure on the gums may cause pus to ooze up from between the gums and teeth if pyorrhoea is present. Local swellings of the gums due to periosteal abscess may occur. The teeth themselves may show marked caries with gingivitis around them. An important clinical symptom often present is a sweet sickly smell of the breath.

In a large number of patients who habitually clean their teeth carefully little or no evidence of a dental infection can be found from an external examination; this point cannot be too strongly emphasized. On many occasions I have seen teeth and gums, apparently perfectly healthy, in which radiographic examination disclosed dangerous peri-apical necrotic lesions. Sir Frank Colyer truly says, in his book on *Chronic General Periodontitis:*

> "It is not safe to judge the extent of the disease from clinical appearances only, and it is necessary to call in the aid of skiagraphy in order to ascertain how far bone destruction has proceeded."

The gums may appear healthy, and yet there may be an extensive disease of the alveolar process around the roots of the teeth, and considerable bone destruction, the involved area being heavily infected with pathogenic streptococci. The grave clinical effects resulting from infected bone are well known, and from observation of a large number of cases which have been carefully investigated by bacteriological and radiological methods I am strongly of opinion that the general clinical effects produced by dental infections are accounted for by the extent and nature of the disease of the bone in the neighbourhood of the teeth, rather than in the gums or teeth themselves, though these latter are the primary causes of the bone disease.

It cannot be insisted upon too strongly that in every case of illness in which the teeth may be primarily responsible—even if external appearances of the teeth and gums are healthy—a radiographic examination should be made to ensure that the alveolar process around the teeth is also healthy.

Radiographic Evidence.

Careful photographs of the teeth and surrounding jaw, taken so that two or three teeth only are included in each plate, will show in detail the exact condition of the roots of the teeth and surrounding bone.

The periodontal membrane of a tooth may be swollen, and the alveolus may show superficial erosion, such as occurs with advanced age, but the most important evidence of all is the presence of necrosis of bone in a more or less spherical area around the apex of the tooth.

These apical lesions are commonly called "apical dental abscesses." The term is a bad one, because there is no pus present, and, most important of all, they give rise to no pain. The term "apical granulomata" has been used; this also is bad, because the microscopical appearances are not those of a granuloma.

When a tooth is extracted with an apical dental lesion, a mass of solid gelatinous substance is found adherent to the apex. This contains pathogenic streptococci and necrotic substance with very few leucocytes. The term "peri-apical bone necrosis" would accurately describe the condition actually present.

In my opinion the "peri-apical bone necroses"—the so-called "apical dental abscesses"—are the most serious lesions found in connexion with dental sepsis, and it is these which give rise to the gravest general disease resulting therefrom. It is probable that from these lesions there is a constant flow into the blood stream of either virulent streptococci or their toxins, and the anatomical position of the lesions prevents an adequate supply of leucocytes and bactericidal body fluids to the part.

An interesting example of the deadly effect of even a small peri-apical bone lesion may be cited here.

CASE I.

In 1919 a patient, aged 46, had been under my care for some months, suffering from the effects of long residence in the tropics. He was in fairly good health and then developed an irregular pyrexia. No evidence of malaria was found and the pyrexia did not respond to quinine. A systolic murmur was present in the apical cardiac area, which was of old standing. A blood culture made by Dr. J. Matthews showed a streptococcal infection. Although the teeth had been pronounced perfectly healthy by an experienced dental surgeon an *x*-ray examination was made, and this revealed the presence of a "peri-apical bone necrosis" round one of the lower central incisor teeth. Extraction of the affected tooth showed a marked infection with streptococci, identical in characters with those found in blood culture. The patient developed additional cardiac valvular lesions and was seen in consultation with me by Sir William Hale-White. The condition was obviously one of infective endocarditis, and this subsequently terminated fatally.

If lesions of this kind are present, the maintenance of health is obviously impossible; some serious general disease is bound to result if it has not already appeared. In my opinion if a lesion of this kind be present no compromise is permissible—the affected tooth must be extracted.

Gardner of America has asserted that extraction of the tooth is not a sufficient safeguard and advises a preliminary trephining of the alveolar process over the peri-apical lesion. The diseased area is then curetted, the tooth extracted, and the infected area sterilized by the application of a suitable antiseptic. In this country the simple extraction of the affected tooth is, I think, considered adequate, and trephining and curettage are not thought necessary.

Where "peri-apical bone necroses" are present the affected tooth is usually dead, and this is an important indication. Attention must here be called to the very common occurrence of this dangerous lesion in connexion with crowned teeth. So common is this occurrence in my experience that I have no hesitation in condemning the procedure of crowning teeth.

Does the Simple Erosion of the Surface of the Alveolar Process around Teeth Call for Extraction?

Each case must be judged on its merits. If there are no obvious symptoms of streptococcal toxaemia, I should say that the answer to this question is No. The presence of gingivitis without bone disease around the teeth should be amenable to treatment and does not necessarily call for extraction.

The presence of pyorrhoea alveolaris does not of itself demand extraction of the teeth. This should only be decided upon after considering the radiographic evidence in conjunction with the local symptoms of pyorrhoea. Also the gravity of the constitutional toxic symptoms resulting from the pyorrhoea will be an important factor. It must be remembered that sometimes pyorrhoea alveolaris may be a secondary symptom of some primary disease, such as dysentery, colitis, scurvy, etc., and if the general disease is cured the cure of the pyorrhoea may follow naturally.

The general factors which influence the effects of dental sepsis are:

1. *The Virulence of the Organism.*—Just as in other pathological infections—diphtheria, for example—a small lesion, if the organism is virulent, may produce very severe effects, or an extensive local dental lesion may give rise to little constitutional disturbance.

2. *The amount of toxins absorbed* into the circulation is an important factor. Everyone who is familiar with hospital out-patient practice has been impressed by the appalling dental sepsis observable by the naked eye in patients with no constitutional symptoms therefrom. The reason must be that there is free discharge of the toxins produced. On the other hand, an invisible deep-seated lesion with healthy gums may be associated with the most severe constitutional effects. The "time factor" is important. If there is only slow absorption the toxic effects will be slighter than with rapid absorption. The whole question is one of dosage with toxin.

3. *The Resistance of the Patient.*—This is a most important factor. Some patients, from constant absorption of toxins, become extremely sensitive, and a condition of anaphylaxis results. The recent work of Sir Almroth Wright on septicaemia is most interesting in this respect, since he has shown that in certain conditions of septicaemia the patient is incapable of developing bactericidal substances. Julius A. Toren of Chicago showed (1921) that in certain cases of dental infection and gingivitis a leucopenia occurred, and he regarded this as an anaphylactic phenomenon and a signal of danger. He concluded that in this condition extraction of many teeth was dangerous, and advised removal of not more than one at a time. This observation has a very important practical bearing.

Secondary Intestinal Infection.

Where dental sepsis is present and it has given rise to general disease, examination of the stool or intestinal washings shows in practically every case a marked preponderance of streptococci similar to those present in the dental lesion. This is an important factor in the consideration of the general effects produced by dental sepsis, for in most of these cases there is a secondary intestinal infection which may of itself cause similar general disease. This explains why in advanced cases of arthritis the disease may progress when the primary dental focus of infection has been eradicated.

The General Diseases caused by Infection of the Teeth and Gums.

Infection of the teeth and gums by reason of the streptococcal infection arising therefrom is undoubtedly one of the greatest sources of disease of adult life.

Acute streptococcal septicaemia and septico-pyaemia have not infrequently arisen from dental sepsis. The risk of this dangerous complication must always be borne in mind in connexion with the extraction of infected teeth in patients whose resistance to streptococcal infection is low. As already mentioned, a leucopenia is a danger signal.

Toxaemia is commonly associated with dental sepsis. It may be chronic, subacute, or acute. Chronic toxaemia is present in a great many of these cases, and in all where some general disease has resulted from the primary dental infection. There is a feeling of malaise and general ill health, a tendency to exhaustion on slight exertion, a pale and muddy complexion is common, and often some general pains in the hands and feet indicate an irritation of the peripheral nerves; frequently some symptoms of fibrositis or threatening arthritis occur. Insomnia, headache, and dyspeptic symptoms are common. In such cases a careful radiographic examination of the teeth should always be made.

Subacute toxaemia may give rise to intermittent pyrexia, with general constitutional symptoms of ill health, extending over months and years.

CASE II.

F., aged 32, recently seen by me, had had an irregular pyrexia for three years, the temperature in the evening commonly being 100° or 101°, and marked constitutional symptoms of ill health were present. Extensive bacteriological investigations had been carried out, with negative result, beyond the finding of a streptococcal infection in the stools. Vaccine treatment had been of no avail. An *x*-ray examination of the teeth showed two extensive peri-apical necroses, although to external appearances the gums and teeth were healthy and no toothache had occurred.

Extraction of the infected teeth by Sir Frank Colyer resulted in the complete disappearance of the pyrexia and restoration to good health.

In some cases pyrexia and general symptoms of ill health are followed by profound *acute toxaemia*, and a condition of stupor, delirium, and coma result.

CASE III.

M., aged 57, had had malaise and irregular pyrexia due to septic teeth. In consequence of this six teeth were extracted on July 24th, 1921. The operation was followed by a condition of profound toxaemia, the patient being in a "typhoid state" with pyrexia, stupor, and low delirium; there was slight splenic enlargement and a macular rash.

All tests for enteric or typhus infections were negative, and it was clear that a severe streptococcal toxaemia was present.

On August 8th the patient was in a lethargic stuporose state, with mild pyrexia, and the condition was very grave.

Several unhealthy crowned teeth were still present, and it was decided to remove one of these each day. The removal of the remaining infected teeth was followed by disappearance of the toxaemic condition, and the patient made a complete recovery. Dr. Geoffrey Evans made a most careful study of this case, and we were both of opinion that the removal of the remaining infected teeth, even though the condition was most grave, held out the only hope of recovery.

Local Infective Conditions Resulting from Dental Infections.

Such conditions as stomatitis, tonsillitis, naso-pharyngeal infections, infections of the maxillary antra, cervical adenitis, and Ludwig's angina have been observed.

Blood Conditions.

A secondary anaemia, mild or severe in type, is a common result of dental sepsis. The more severe types of anaemia are associated with streptococci of haemolytic type. In many cases of pernicious anaemia a severe dental infection with haemolytic streptococci is present. Hunter does not regard dental sepsis alone as a sufficient cause of pernicious anaemia, but rather as a predisposing cause to which an additional factor is added.

Leucocytosis is commonly present, and usually the differential count approximates to the normal. It may show variations in different cases, and in the same case at different stages of the disease.

Some acute cases show a marked relative lymphocytosis. This may be a true lymphocytosis, or simply an apparent lymphocytosis, due to a polymorphonuclear leucopenia.

Thus, in one acute case the blood examination on July 22nd, 1922, showed a leucocytosis of 16,600, with 17.5 per cent. of polymorphonuclears and 79.5 per cent. of lymphocytes. On August 3rd the polymorphonuclears were 30 per cent. and the lymphocytes 65.7 per cent. On August 9th the polymorphonuclears were 64.29 per cent. and the lymphocytes 34.28 per cent.

Another similar acute case showed on February 9th, 1921, a normal differential count, and on April 20th the lymphocytes were 52 per cent. and the polymorphonuclears 44 per cent.

An increase of the eosinophilia is uncommon. Two cases, however, have come to my notice.

The first patient (Case I) gave, on August 24th, 1919, 20 per cent. of eosinophile leucocytes; on September 3rd 12 per cent.; on November 22nd 15.05 per cent., and on January 9th, 1920, 8.17 per cent.

Another patient, who had never resided in the tropics, showed 9 per cent. of eosinophile leucocytes in the differential count.

The presence of leucopenia in some cases has already been alluded to.

Cardio-vascular Complications.

Streptococcal infections of dental origin may cause phlebitis and venous thrombosis, and also arterio-sclerosis, which is not necessarily associated with an increase in the blood pressure. The changes in the arterial wall may give rise to narrowing of the lumen with symptoms of intermittent claudication, or even arterio-thrombosis.

Cardiac Conditions.—Tachycardia of toxic origin is often to be observed, and pericarditis, myocarditis, and myocardial degeneration may occur. Endocarditis when present may be of the simple type, such as occurs in acute rheumatism, but not infrequently dental sepsis gives rise to ulcerative endocarditis. Five such cases have been under my care during the past three years, where the origin of the infection appeared to be definitely the teeth.

Respiratory Complications.

The streptococcal infection may give rise to laryngitis, tracheitis, and bronchitis. Pleurisy and empyema were described by Hunter in 1900 as possible complications. Septic bronchopneumonia is a serious and not uncommon complication, and it may be followed by bronchiectasis, or ung abscess.

At the present time a patient is under my care in St. Mary's Hospital suffering from abscess of the lung the result of very severe dental sepsis. Attention has been called to the adverse influence of dental infections in cases of pulmonary tuberculosis by Dr. R. C. Wingfield.[2] He considers the removal of dental sepsis an essential preliminary in the treatment of pulmonary tuberculosis, and says that in such cases untreated oral sepsis may frequently turn the balance against the patient.

Gastro-intestinal Complications.

Dental sepsis is one of the commonest causes of gastric and intestinal dyspepsia. Hunter in 1899 laid stress on the frequency of toxic or infective gastritis, and he then expressed the opinion that dental sepsis was the probable cause of some cases of that rare condition "phlegmonous gastritis."

Gastric and duodenal ulcer probably result from septic infection, and the trend of opinion at the present time is that dental sepsis is a most important cause. In my experience it is rare to find a case of gastric or duodenal ulcer in which an adequate explanation of the cause cannot be found in the condition of the teeth and gums, and I should say that dental sepsis was much the most important etiological factor. The work of Rosenow in America gives strong support to the view that gastric and duodenal ulcer arise from streptococcal dental infection, and he has produced gastric and duodenal ulcer in animals from inoculation with cultures of human dental streptococci.

Appendicitis is, in many instances, due to a streptococcal infection, and several cases have recently been under my care in which the primary infection appeared undoubtedly to arise from the teeth.

Enteritis, with symptoms exactly like paratyphoid fever, including enlargement of the spleen and similar pyrexia, may undoubtedly result from streptococcal dental infections. The differential diagnosis can only be made by complete bacteriological investigations, and by the recognition of the dental disease for which often radiological examination is necessary. Three cases of this kind have been under my care.

Colitis, simple and ulcerative, is frequently due to a streptococcal infection, and in many of these cases the primary focus is undoubtedly connected with the teeth. Peri-apical dental necroses will often be found in intractable cases of colitis. Dr. N. Mutch[3] has called attention to the frequency (84 per cent.) of pathogenic streptococci in the colon in an analysis of 200 cases of arthritis. In 52 per cent. of these cases he concluded that the primary focus was a dental infection.

Renal Complications.

Nephritis has been described by many writers as sometimes resulting from dental sepsis.

Liver Complications.

Toxic conditions of the liver are well known to result from streptococcal infections, and frequently slight jaundice and evidences of hepatic disturbance are observed in cases of dental infection. There can be no doubt that hepatic efficiency is often impaired as the result of the toxaemia from dental sepsis.

Skin Complications.

Rashes of an erythematous, urticarial, papular, and eczematous type have been observed. Purpuric rashes may occur, especially where the streptococci are of the haemolytic type.

Eye Complications.

Conjunctivitis, iritis, irido-cyclitis, episcleritis, retrobulbar neuritis, have all been described as resulting from dental infections. Undoubtedly vascular lesions, such as thrombosis of the central artery or vein of the retina, may be so caused. Of special interest is retinitis. Dr. Batty Shaw has recently called attention to the great importance of the toxic factor in this condition, and undoubtedly dental sepsis is not infrequently the cause.

Nervous Diseases.

The toxaemia from dental infections may give rise to cerebral conditions such as abnormal mental states, melancholia, etc., and it is possible that inflammatory conditions, such as meningitis, may be so caused.

Spinal cord diseases, such as combined sclerosis with its associated anaemia, disseminated sclerosis, etc., are often due to toxic causes, and dental sepsis must be included amongst these.

Peripheral neuritis may occur from the streptococcal toxaemia of dental origin, and the sensory symptoms, tingling, and numbness of the hands and feet are of common occurrence. Local neuritis, such as sciatica, brachial neuritis, etc., is a common result of dental sepsis, but these are better included under the fibrositis group, because the cause is rather a perineuritis than a primary involvement of the nerve fibres.

Rheumatic Conditions.

In a paper published in the BRITISH MEDICAL JOURNAL (June 4th, 1921) I called attention to the great importance of infection of the teeth and gums in the causation of rheumatic conditions such as fibrositis and infective arthritis.

Fibrositis.—The streptococcal infections so arising may give rise to the various forms of fibrositis—namely, panniculitis, inflammatory conditions of fasciae, and aponeuroses—as occurs in lumbago and myalgic conditions; inflammations of tendons and ligaments, such as stiff neck, tender heels due to involvement of the plantar ligaments, Dupuytren's contractions of the palmar fascia; inflammations of tendon sheaths, arterio-synovitis; bursitis; Heberden's nodes; finger pads; fibrous nodules in subcutaneous tissue; local perineuritis and neuritis, as in sciatica and brachial neuritis. Fibrositis in some of its forms is the commonest occurrence in cases of dental and gum infections.

Non-specific infective arthritis, which includes the forms known as rheumatoid arthritis, arthritis deformans, osteo-arthritis, and chronic villous arthritis, is generally due to a streptococcal infection. Dr. Beddard, in a paper before this Society in October, 1918, expressed the opinion that 90 per cent. of these cases were due to infection arising from the teeth, and my personal experience agrees with this view.

It is well known that in cases of non-specific infective arthritis numerous bacteriological examinations have shown that no living organisms are to be found in the joints. It is probable that the streptococcal toxins give rise to the inflammatory conditions. The recent work of Dr. W. E. Gye, and Dr. E. H. Kettle has shown that marked proliferative changes can occur in organs such as the spleen, through the action of colloidal silica, without the presence of living micro-organisms.

Acute rheumatism is not commonly caused by dental infections, but several cases have been described. The organism found by Poynton and Paine in numerous cases of acute rheumatism closely resembles the *Streptococcus salivarius* and *S. faecalis* found in dental infections.

Gout.

In some cases of gout dental sepsis is important, and should be removed, as far as possible, in every gouty patient. Dr. Llewellyn has expressed the opinion that gout is the result of a toxic idiopathy to certain toxic protein substances. Undoubtedly the streptococcal toxins of dental origin are in not a few cases the important causative factor.

Diabetes.

Streptococcal and other toxins may cause a toxic glycosuria, probably by impairment of the endocrine function of the pancreas. Dental sepsis is undoubtedly a factor in the causation of glycosuria in some cases, and it should always be removed in cases of diabetes. A rise in the carbohydrate tolerance has often been observed by me after the removal of dental sepsis in early cases of diabetes.

Scurvy.

This disease, due to vitamin deficiency, shows marked dental sepsis on its earliest appearance. During the war over 20,000 cases of scurvy occurred amongst Indian troops in Mesopotamia, many of which I personally examined, and in almost all very marked infection of the teeth and gums was present. The result of careful observation showed that if pre-existing dental sepsis was present in a marked degree, then such patients were very predisposed to develop scurvy.

TREATMENT.

The treatment of infections of the teeth and gums, and the diseases arising therefrom, does not come within the scope of this discussion. The most important general principles in the treatment of such infections have, however, been indicated, namely:

First, remove the focus of infection, either by extraction of teeth, or suitable treatment.

Secondly, it must be remembered that intestinal infections very frequently result from dental infection, and these may

require treatment by such measures as Plombières colon irrigations, or an autogenous vaccine prepared from the streptococci found in the teeth and intestine.

Prophylaxis.

The early recognition of dental sepsis and its appropriate treatment would be one of the most important factors in greatly improving the health of the nation.

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REMARKS ON THE VALUE OF BUTYN AS A LOCAL ANAESTHETIC.*

BY

W. M. BEAUMONT,

CONSULTING OPHTHALMIC SURGEON, S.W. REGION, MINISTRY OF PENSIONS.

FOR some years the experts connected with the Abbott laboratories of Chicago experimented assiduously to find a synthetic substitute for cocaine, and in 1918, with the collaboration of Professors Roger Adams and Oliver Kamm of the University of Illinois, butyn was discovered; in their opinion it fulfils all the requirements they had in view. The next step was to refer butyn to a committee of the Section of Ophthalmology of the American Medical Association under the chairmanship of Dr. Albert Bulson, jun., of Indiana, and after prolonged clinical investigation a report was published[1] early in 1922. The conclusions are summarized as follows:

1. Butyn is more powerful than cocaine, a smaller quantity being required.
2. It acts more quickly than cocaine.
3. Its action is more prolonged than that of cocaine.
4. Butyn in the quantity required is less toxic than cocaine.
5. It produces no drying effect on tissues.
6. It produces no change in the size of the pupil.
7. It has no ischaemic effect and therefore causes no shrinking of tissues.
8. It can be boiled without impairing its anaesthetic efficiency.

Unlike cocaine, it does not deteriorate quickly by keeping—an advantage to those practitioners who wish to have a supply ready in case of emergency. Still more important, it has no attractions for the drug taker.

Professor Adams in a letter tells me that his first experiments on toxicity were disappointing because he found that with mice butyn was two or three times as toxic as cocaine. But, on the other hand, its anaesthetic power was also two or three times as great as cocaine. Further experiments showed him that the comparative degree of toxicity varied with the size of the animal. For instance, with guinea-pigs the two substances are about equally toxic. In cats butyn is about 15 per cent. less toxic, and in dogs from 25 to 30 per cent. less toxic, than cocaine. In monkeys the toxicity of butyn is probably as low as 50 per cent. compared with cocaine; but these latter experiments are not yet completed. Professor Adams considers that it may be concluded that in man it is still less toxic. This view is supported by the fact that no toxic symptoms have occurred in America although butyn has been used in many cases. The low toxicity of butyn was confirmed by the committee of the Section of Ophthalmology of the American Medical Association.[2] In the opinion of the manufacturers butyn is probably considerably less than half as toxic as cocaine.

Tests.

Dissolve 1 gram of butyn in 10 c.cm. of water. Separate portions of the solution yield a white precipitate with potassium mercuric iodide solution; a brown precipitate with iodine solution; a brown precipitate with gold chloride solution; and a yellow precipitate with picric acid solution. A portion to which barium chloride solution is added gives a white precipitate (distinction from procaine).

Dissolve about 0.1 gram of butyn in about 5 c.cm. of water, add 2 drops of dilute hydrochloric acid and 2 drops of sodium nitrate solution (10 per cent.) and mix with a solution of 0.2 gram of beta-naphthol in 10 c.cm. of sodium hydroxide solution (10 per cent.). A scarlet-red precipitate is formed (distinction from holocaine, which gives a white precipitate).

To a solution of about 0.1 gram of butyn in 5 c.cm. of water add 3 drops of diluted sulphuric acid and mix with 5 drops of potassium permanganate solution. The violet colour of the latter disappears immediately (distinction from cocaine).

Dissolve about 0.1 gram of butyn in 1 c.cm. of sulphuric acid. The solution is colourless (organic impurities).

Dissolve 0.1 gram of the salt in 10 c.cm. of water and saturate with hydrogen sulphide. No coloration or precipitation occurs (salts of heavy metals).

Incinerate about 0.5 gram of butyn accurately weighed. There is not more than 0.2 per cent. residue.[3]

Early in 1922 I resolved to try butyn, but the impossibility of getting it in England caused some delay, and it was necessary to send to Chicago. Unlike some German substitutes, butyn, not being a derivative of cocaine, can be freely prescribed without restriction.

In Eye Work.

In ophthalmology butyn has been extensively used in the United States. Dr. H. S. Gradle, from an experience of more than 2,000 cases, finds it superior to cocaine and holocaine in eye surgery.[4]

My own experience is confined to about 60 cases, including operations for the extraction of cataract, discission, iridectomy, removal of foreign bodies, and skin operations on the lids by infiltration. For operative work on the eye a 2 per cent. solution is used, but for profounder anaesthesia 4 or 5 per cent. Four applications should be made at intervals of two minutes. If a bloodless field is required, a drop or two of adrenaline solution (1 in 1,000) may be instilled after the last drop of butyn. The eye is then ready for operation. For operations on the skin of the lids 10 drops or more of a 0.5 per cent. solution may be injected subcutaneously with a hypodermic needle.

For all operative work on the eye, in my experience, butyn is most satisfactory, the anaesthesia being more profound and prolonged than when cocaine is used, and there are no after-effects. I sum up my present position with regard to butyn by saying that neither in the consulting room nor in the operating theatre have I found it necessary to resort to cocaine during the last nine months.

Butyn in Ear, Nose, and Throat Work.

Some 200 operations have been done, including septum resection, tonsillectomy, adenectomy, opening accessory sinuses, etc. It can be used in a 2 per cent. solution and applied topically. It acts efficiently and is superior to a 5 per cent. solution of cocaine. For profounder anaesthesia for major operations on the throat and nose, 5 per cent. may be used, and adrenaline can be added for all intranasal operations. Dr. Bulson of Indiana reports that still stronger solutions can be used in throat operations.[5] For intranasal work he employs a 5 per cent. solution of butyn, with epinephrin, swabbed over the operative field and beyond, if possible.

"Within two or three minutes following the first application, flattened pledgets of cotton soaked with the solution, but from which the surplus has been squeezed out, are applied over the operative field and when possible over the source of the sensory nerve supply. These pledgets are removed after the end of five to eight minutes. Five minutes later the operation may be commenced with the assurance that in practically all cases the patient will suffer no pain or even discomfort."

I can find no record of butyn having been used as a spray. Nevertheless there seems to be no contraindication.

Butyn in Dentistry.

In dentistry butyn is notably satisfactory. There are none of the after-symptoms which sometimes occur with other local anaesthetics. Ten drops or more of a 1/2 per cent. solution are injected on opposite sides of the tooth to be extracted, with or without adrenaline, and after sixty seconds the tooth is ready to be removed. I quote the following from a report issued by the Abbott laboratories.

"In March, 1921, the first (dental) extractions under butyn anaesthesia were performed by a Chicago dentist. Following about 100 such cases, quantities of butyn were sent to a considerable number of dental practitioners in all parts of the country. These men used butyn in various concentrations for all types of dental anaesthesia. As their reports began to come in it was apparent that it was producing results of a far more satisfactory nature than had at first been expected. The dentists who were co-operating with us in this research simply had to tell their friends of the unusually fine results they were getting with this new

* Read at a meeting of the Bath and Bristol Branch of the British Medical Association, November 29th, 1922.

anaesthetic, some of them actually demonstrating it at scientific meetings, and we received many inquiries from all over the country for more information. It was decided, however, not to recommend butyn for use in dentistry until we should have the evidence of many thousand cases to support the statements of its advantage reported to us by the various investigators. . . . Several hundred dentists have used butyn in probably more than 10,000 cases of dental operations. It has run the gamut of infiltration, nerve blocking, topical application, pressure anaesthesia, pulp anaesthesia, in fact, practically every use to which a dentist might put a local anaesthetic, and has come through with high honours. Now we feel justified in presenting butyn to the dental profession, strictly on its merits as evidenced by actual clinical experience."

Hitherto I have only been able to persuade one dental surgeon to give butyn a trial. His experience after three months has induced him to give up entirely the usual dental injections in favour of the new one.

Spinal Anaesthesia.

Butyn has not been used for producing anaesthesia preliminary to lumbar puncture. But as cocaine is not usually resorted to in these cases because of its toxicity, the question of butyn as a substitute does not arise; stovaine, novocain, etc., appear to be sufficiently effective for intraspinal anaesthesia. The only point to which I wish to draw attention is the displacement of cocaine by butyn in all cases in which the former is now used. If this can be done without disadvantage there seems to be no reason why cocaine should not be entirely eliminated from the pharmacopoeia.

For Genito-urinary Anaesthesia.

Butyn is recommended in cases in which the mucosa is so painful that any topical treatment seems impossible. Intra-urethral and endovesical examinations, including the introduction and use of sounds, bougies, etc., are said to be entirely painless when butyn is used. A 2 per cent. solution is usually employed; 4 c.cm. of the solution are injected with an ordinary blunt nozzle urethral syringe, allowing the solution to remain in the urethra for three minutes; it is then withdrawn, and in a few minutes the examination or clinical treatment is proceeded with. In operative work, such as internal urethrotomy, a 5 per cent. solution of butyn is preferable. It is applied for three minutes, and the operation is then painlessly conducted two minutes later. When the orifice of the urethra is so narrow as to require incision it is found that a pledget of cotton-wool soaked with a 5 per cent. solution of butyn applied for five minutes enables the operator to make the incision and suture it without infiltration anaesthesia.

Percentage Table for the Use of Butyn.

	Surface Anaesthesia.	Infiltration.	Operations.
Eye	1 per cent.	0.50–1 per cent.	2 per cent.
Dentistry	—	0.50–1 per cent. (minims 10–20)	—
Nose and throat ...	2 per cent.	—	5 per cent.
Minor surgery	—	1 per cent.	—
Genito-urinary, urethrotomy, etc. ...	2 per cent.	—	5 per cent.

Conclusion.

There is no need to emphasize the benefit which would follow the passing of cocaine, the time for which I believe has arrived. If it can be firmly established that butyn possesses the good qualities of cocaine without the bad ones it should be recognized and acted on by surgeons.

I do not advocate a hurried and ill-considered edict of outlawry against a drug which has served a useful purpose for forty or fifty years, but it seems to me that the time is ripe for the consideration of a substitute. An investigation should come from the profession voluntarily and not be forced upon us by public opinion.

In conclusion I recommend surgeons to try butyn—first because cocaine is a national danger, and secondly, because I believe that butyn is a superior local anaesthetic.

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STANDARDS OF VISION FOR SCHOLARS AND TEACHERS IN COUNCIL SCHOOLS.*

BY

N. BISHOP HARMAN, M.A., M.B., F.R.C.S.,

OPHTHALMIC SURGEON, WEST LONDON HOSPITAL, AND BELGRAVE HOSPITAL FOR CHILDREN.

WHEN the student sat at the feet of Gamaliel it may be supposed that defect of eyesight troubled him not at all, for he learnt by listening to and discussing the precepts of his master. And Gamaliel was probably as little troubled, for his book was one, and that so large as to be decipherable by even venerable eyes. To-day the student must read much, and for many hours for weeks on end, both in daylight and at night; the work entails no mean output of nervous energy even to good eyes, and the energy expended is progressively increased out of all proportion when the eyes are defective.

In the recent past, when similar conditions of work brought about such difficulty as to require the cessation of the student's work, the stoppage entailed no more than a re-arrangement of a projected career. To-day it may mean the surrender of a bursary or scholarship gained by hard work and much prized. The disturbance is greater, and it is the more severe, with each step which the student has gained in his career. The teacher's life is also more strenuous; short hours and sufficient holidays do not ensure against risks of strain to normal eyes, and the risks are increased with defective sight. The modern teacher's work is not begun and ended in the classroom; much of it must be done out of school hours. Preparation is as imperative for the conscientious and efficient teacher as for the pupil. Moreover, schools worth the name are social communities, and in elementary schools the burden of securing and shaping this social life falls upon the teachers and not upon prefects or sixth form pupils; the energy spent in this regard by teachers is a material draft upon their resources.

Scholarships and College Training.

This paper deals solely with the State-provided educational scheme. This includes elementary schools, secondary schools, and the technical institute, training college, or university. The provision of bursaries, scholarships, and college training by the community for the purpose of advancing the scheme of education meets with universal approval. But beneficent as are these provisions, they introduce certain difficulties—it may be said that they in a sense aggravate or accentuate the disabilities of those who suffer some physical handicap. It is a corollary of this educational provision by the community that there shall be required of those who are to be permitted to enjoy these advantages a physique sufficiently good to allow them to make full use of the provision. It may be said that in providing the opportunity the community assumes a responsibility for those whom it permits to accept it. Again, the provision is costly; lack of care in the selection of bodies will cause wastage of the educational provision. Every failure during student and teaching life is so much loss of this costly provision. It means also that some other candidate who might have made better use of the provision is kept out by a failure. It may seem also that the gift of the community to the failure was ill judged; the gift entailed a course of work which in the end proved injurious to the recipient—he would have been better and happier if he had not had that gift.

Physical Fitness and Sight Tests.

There are many points of physical condition in which a candidate may be required to pass, and these will vary with the educational course in prospect. We are only concerned with eyesight, and in that respect visual acuity is not the only test; we are concerned with the actual condition of the eyes, for the test has to certify fitness not only at the moment, but for a future career of years. We are all familiar with visual standards for certain purposes—for example, navy, mercantile marine, railway, etc. There is evidence that some such standards are desirable for educational purposes before admission to scholarships, to college course, and to the ranks of teachers. As I have sought to show, these standards are necessary in the interests of the candidates themselves, and they become the more necessary immediately we subject the candidate to any sort of physical test, for by the institution of any test we in fact

*A paper read before the Royal Society of Medicine, Section of Ophthalmology, October 13th, 1922.

give the candidate and his guardians a guarantee of some sort of fitness for the work. Most local education authorities have instituted such tests. That they are not always satisfactory is indicated by reports of some school medical officers. There is also a necessity for some measure of uniformity in the tests throughout the country, for trained teachers are in a sense current coin and legal tender to any educational authority. It is in every way good that this should be so, for the more movement there is amongst the teachers the wider their outlook and the better teachers they make. It is therefore lamentable when a teacher trained by one authority is rejected on account of defective eyesight by another authority. The purpose of this paper is to suggest for agreement the limits of defective sight permissible for candidates for scholarships, training college, and teaching posts in council elementary and secondary schools.

Children in elementary schools are examined as a matter of routine thrice—at about the ages of 5, 8, and 14 years. Children suspected of defect are examined at any time. The average age for entry upon a junior county scholarship is 11 years; the holder is transferred to a secondary school for five years. Intermediate scholarships are awarded a year later, and give four years at a secondary school. Senior county scholarships are granted at the age of 16 years and are available at a university for four years. Prospective teachers undergo training at a college between the ages of 17 and 20 years. Thereafter a teacher's life extends to the age of 65 years, when a pension is earned. During service failure of health is met by temporary allowances on a generous scale, and a complete breakdown necessitating retirement is met by a modified pension and a gratuity after ten years' service and a small gratuity after two years' service. Such provision adds to the necessity for care in the selection of candidates.

Defective Vision and Inefficiency.

In considering what limitation in defect should be made at the several stages of an educational career it is convenient to take the teacher first. If we can arrive at a fair standard of fitness at about the age of 21 years at the entry to the strenuous career of forty-five years' teaching, and a standard that will provide a reasonable prospect of efficient service and limit the risk of early disablement, the main part of our task is done. It will be comparatively easy from that standpoint to adjust a scale fitting junior and senior scholarships and a college course.

The question will at once arise, What evidence is there of inefficient service or disablement due to defective vision? That question is not easy to answer in terms of figures. Such answer of this sort as is possible I gave this year in a paper read before the Ophthalmological Society.[1] That evidence dealt with myopes only. Similar evidence for hypermetropes cannot be presented. Every ophthalmic surgeon sees a fair selection of myopes, because all myopes suffer the disability of being unable to see. We do not get a similar fair selection of hypermetropes; we get only those who fail to see with comfort. So that although it is possible to suggest a definite answer as regards the myopes we can only arrive at an estimate in the case of hypermetropes based upon our general appreciation of the effects of hypermetropia in causing eyestrain in early middle life, from 30 to 35 years, when the vigour of youth and its compensatory powers are beginning to wane. The evidence as regards the myopes is as follows:

A series of histories were gathered of myopes of over 3 D. between the working ages of 20 to 60 years, and classified according as they were engaged in close work all day or in manners of life which did not entail habitual close work. Of the close workers, no less than 53 per cent. came to a time when there was an unmistakable failure of ability to carry on because of serious eyestrain; some changed their occupation to work that did not entail close eye work; most could not do this, and had to "ca' canny" for the sake of their eyes. Of myopes of the same types and ages who were not engaged in continuous close work, only 9·4 per cent. experienced a critical failure of capacity owing to eyestrain or disease. If we classify the myopes who were engaged in habitual close eye work according to degrees of myopia we get the following:

Myopia	3 to 5 D.	...	...	Breakdown	33.7 per cent.
,,	5 to 10 D.	...	...	,,	66.5 ,,
,,	over 10 D.	...	...	,,	77.4 ,,

These figures represent a fair indication that myopia of more than 5 D. presents an undue risk of inefficiency or breakdown for teachers, who must be classified as those who are engaged in habitual close eye work.

Suggested Standards for Teachers.

Visual Acuity.—The vision of each eye separately should equal Snellen's 6/9, with glasses needed to correct an error of refraction within the allowable standards; or with inequality of the eyes, 6/6 in the better eye and 6/18 in the worse, also with glasses. Exceptions may be allowable in amblyopia of one eye or loss of one eye not arising from disease (vide infra).

Hypermetropia.—This usually only causes trouble when it exceeds 5 D. With this degree, or more, vision can rarely be brought to the full 6/6 standard with glasses. The subjects of the defect are very liable to headaches and failure of vision in periods of ill health; these concomitant disorders are more frequent in women than in men. Candidates with hypermetropia not exceeding 5 D. may be accepted.

Hypermetropic Astigmatism.—When this error is uncomplicated by hypermetropia the error should not exceed 4 D.; higher errors are very troublesome; full vision of 6/6 is rarely obtained with the most suitable glasses. With compound hypermetropic astigmatism the average is found—that is, the sum of the four meridians should be divided by 4; if the quotient does not exceed 5 the candidate may be accepted provided the total astigmatism does not exceed 3 D. in either eye: for example, R. and L. +3.5 D. sphere + 3 D. cylinder, the sum of the four meridians = 20 and the quotient 5, the candidate would be passed. Both hypermetropia and hypermetropic astigmatism are very liable to cause fatigue on close work and in ill health, and the defect becomes increasingly disturbing with years, so the decision regarding any candidate has to be made with this regard.

Myopia and Myopic Astigmatism.—The defect has its own special disability in that it is not only liable to cause strain but that it is very likely to increase with work. Also there is the additional liability to degenerative changes in the eye, whether of vitreous lens or of choroid and retina. Simple myopia of 5 D. or myopic astigmatism of 4 D. should be passed. In compound myopic astigmatism the total myopia should be calculated in the same manner as the hypermetropia; the sum of the four meridians should be divided by 4, and if the quotient does not exceed 5, and the total astigmatism in either eye does not exceed 3 D., the candidate should be passed. Mixed astigmatism should be classed with myopic astigmatism.

Odd Eyes.—When one eye has (*a*) normal vision with 6/6 vision or better, or (*b*) the vision of 6/6 with glasses correcting an error of refraction not exceeding *plus* or *minus* 3 D. sphere, less importance should be attached to the defect of the other eye, provided there is no sign of disease in that eye: for example, R. −3 D., L. −5 D. sphere with −4 D. cylinder, sum of meridians=20, quotient 5, the candidate may be passed. Amblyopia in one eye due to squint, the deformity of which has been satisfactorily corrected, should not disqualify.

Loss of one eye by reason of accidental injury which in no way affects or is likely to affect the remaining eye should not disqualify for scholastic studies or employment, provided the deformity is satisfactorily masked by an artificial eye. Monocular cases should not be admitted to trade scholarships where there is risk of injury arising out of the work.

Opacities.—The presence of opacities in the media of the eyes, or of uveitis, should render the candidate unfit at any age. Cases showing signs of past or present iritis, cyclitis, and most cases of keratitis would, under this rule, be disqualified, but not cases of stretching of the choroid about the optic discs due to the allowable degrees of myopia.

Colour Vision.—This should be tested in every case, but deficiency in this respect should not disqualify the candidate except in special circumstances.

Sex Differences.—If it be not too great a heresy in these days to distinguish between men and women candidates, I should be inclined to allow men a greater margin of error than women. That high conscientiousness of women, so admirable in the nursery, becomes a source of weakness to the school teacher; women also appear to be more susceptible to the effects of eye defect in causing neurasthenia than do men; further, the more sedentary pursuits of women out of school render their health less robust than the men's and their liability to strain greater.

Standards for Scholars.

For children, the same limitations should apply as regards visual acuity, hypermetropia, hypermetropic astigmatism, odd eyes, and damaged eyes, as for the teachers. The only difference in the scale will arise in the case of myopia and myopic

astigmatism. With the children one has to take into account the prospective increase in the myopia during the years of study, and set a limit to the defect at such a level that the average number of candidates will not have advanced their degree of myopia to such an extent as will cause them to be rejected when they apply for service as teachers. There is a difference of ten years between these two periods, the time of the attainment of a junior scholarship and of leaving the teachers' training college. If, therefore, we allow for an increase of two diopters of myopia during those ten years of hard study, the limit of myopia for children taking junior scholarships at the age of 11 years would be 3 D. At the middle period of 16 years, the time of the senior scholarships or the commencement of the college course it would be 4 D. No sex differences should be made at these ages. Exceptions might be made in the case of university candidates for whose subsequent career the local education authority has no responsibility, but in these cases the risks of overstudy should be made clear to the candidate and the parents. Cases of possible hardship amongst the children in the limitation of myopia will be discussed later. The foregoing would give the following standards:

Table of Standards for Candidates for Scholarships and Teacherships.

	Age.	Spherical.	Cylindrical.	Spherico-cylindrical.
(a) Hypermetropia.				
All candidates	11-21	5 D.	4 D.	Average of four meridians = 5; astigmatism not over 5 D.: *e.g.*, + 3.5 D. sph. c. + 3 D. cyl.
(b) Myopia with Mixed Astigmatism.				
Teacherships	21	5 D.	4 D.	Average of four meridians = 5; astigmatism not over 3 D.: *e.g.*, − 3.5 D. sph. c. − 3 D. cyl.
Senior scholarships ...	16	4 D.	3 D.	Average of four meridians = 4; astigmatism not over 3 D.: *e.g.*, − 3 D. sph. c. − 2 D. cyl.
Junior scholarships ...	11	3 D.	3 D.	Average of four meridians = 3; astigmatism not over 2 D.: *e.g.*, − 2 D. sph. c. − 2 D. cyl.

The Limitation of Myopia.

Some difficulty will arise in dealing with children who have won scholarships and who are found, on medical examination, to have defective sight. The difficulty is practically limited to the myopes; it rarely occurs with hypermetropia. Many of these children are described as "brilliant," always at the top of the class, and therefore favourites with their teachers. The proposal to debar such children is very likely to cause an outcry. In dealing with these young myopes too much stress should not be laid on the "brilliance" shown by them. In many cases their standing in the schools to which they belong is not wholly warranted. Their academic attainments are forced. The time that should be given to healthy play, and which is so occupied by their normal comrades, is used by them for additional study. The class advantage thus obtained by the myopes is in some sense unfair to the normal children, who in later years are likely, by reason of their more robust physical equipment and better staying powers, to out-distance the myopes. If this fact be borne in mind, the disqualification of a certain number of myopes, and particularly those with astigmatism, will be no disadvantage in the long run.

When the myopia is of low degree and is corrected by glasses, the new world presented to the child is to some extent a corrective of the reading habit, and with the inculcation of proper habits and a limitation of study its work may be continued. But where the short sight is of more than ordinary degree there can be no question that the interest of the child, as well as of the educational service, is best served by directing its capacities into channels other than the scholastic. The grant of a scholarship for further education of the ordinary type to such a child is to do the child a very real injury. The citation of the place in the class list by the teacher, and a natural unwillingness to disappoint the child of a hard-won success, must be disregarded.

In exceptional cases where there is undoubted ability in some particular branch of scholastic work, and where the excess of defect over the maximum allowable is small, it may be desirable to allow the continuance of the scholastic work: in such cases the parent should be informed in writing of the risks involved, and of the possibility of a check and disqualification at a later stage. But, with rare exceptions, it is better to make the check at the earliest possible age and to divert the work of the child into safer channels. In my experience parents readily understand the position when it is carefully explained to them, and are anxious to safeguard their children's eyes, notwithstanding some temporary disappointment at the check in a scholastic career.

The Genius.

Objection may be raised to such an averaging of the physical and mental capacities of the scholarly amongst the rising generation, by the allegation that it will eliminate the genius from the educational ladder provided by the State for the very purpose of advancing the capable. Personally, I am unmoved by such a prognostication. First, it is an assumption that geniuses are always physically defective; I believe that more are well favoured than ill favoured. Secondly, it is certain that the fire of genius is such that where it is present it will blaze its own trail and need no common road or ladder to bring it to its goal. To the possible objection that it will eliminate the genius from the ranks of the teaching profession, I would reply that this is all to the advantage of both the genius and the schools. Genius may survive the routine of a clerkship in an office of accountancy, but I doubt if it would survive the strenuous life of an elementary school teacher, and I doubt if a repressed genius would be a fitting preceptor of children or show that self-control which is the first essential of an example in discipline.

Special Subjects of Instruction.

Teachers and scholars recommended for subjects other than the ordinary curriculum of elementary and secondary schools and colleges may be made the subject of special exceptions where the work in which it is proposed they should engage does not entail much close eye work. For example, there is little continuous eye work demanded of students or teachers of domestic economy, housewifery, cookery, laundry, drill, and kindergarten. Technical subjects for men teachers, such as carpentry and shoemaking, fall within this category. A wide allowance may therefore be made in the judgement of fitness for trade scholarships and teaching—for example:

For building trades vision sufficient for safety is necessary, and good colour vision for painters. In engineering a considerable defect of vision that can be corrected by glasses is no drawback; indeed, in some bench work glasses are a protection. In furniture making good eyesight is necessary, but for all ordinary carpentry considerable defect is no complete drawback.

For women cookery may be well done with glasses for even high degrees of error, and in a properly constructed kitchen there is no difficulty from the steaming of the glasses. High myopes may have to be excluded owing to the risk of injury against saucepan handles or in lifting heavy cooking pots. In the laundry glasses are a bar, except for some of the finer work. Dressmaking and embroidery may only be engaged in by those with good sight. Millinery is less trying. Occasionally, where there is some physical disability, such as in cripples, sewing work is the only work that can be engaged in despite defective vision.

Tailoring both for men and women demands good sight, the more especially since the sewing is fine and has to be done on dark materials. Photography and photo-process work is difficult for hypermetropes and for those with astigmatism; myopes suffer little at the work. Silversmithing, jewellery making, engraving, and printing all require good sight. Both hypermetropes and myopes are liable to fail with advancing age. General upholstery work makes no special strain on the eyes.

Special arrangements may be made in the case of young persons with defective sight who show special capabilities for the teaching profession by setting them a course which would enable them to become teachers in myope classes or schools for the blind. Courses may be arranged in such a fashion that there is a minimum of close eye work. There is an increasing field for teachers in the training of children in myope classes, and those who themselves suffer some defect may by reason of their disability be the better able to appreciate the difficulties of the children.

To conclude: The standards of vision here suggested are not put forward as counsels of perfection, but as fair average

standards, such as will debar as few promising candidates as possible and yet limit future risks. It cannot be too strongly urged that decisions in scholastic cases are decisions for a lifetime, and not merely decisions for the three years or so of military service. It is therefore better in every way to stop a dubious case at the very beginning, when a diversion of interest is easy, rather than to risk the grievous hardship of a stoppage in the future, with the possible wrecking of an established career.

REFERENCE.

1 The Consequences of Myopia as an Industrial Disease of the Eyes, *Trans. Ophthalm. Soc. U.K.*, 1922.

THE EFFECT OF ANAESTHETICS ON THE LUNGS.

(Preliminary Communication.)

BY

R. J. S. McDOWALL, M.B., D.Sc., M.R.C.P.EDIN.

(In the Department of Physiology, University of Leeds.)

IN the issue of this JOURNAL for November 11th, 1922, was published the report of the discussion at the Annual Meeting of the British Medical Association on broncho-pulmonary complications following operations under anaesthesia, and it was a strange coincidence that the succeeding article should be on the effect of anaesthetic vapours on tissues, in which Flemming has collected a very interesting series of experiments which show their detrimental effects on tissues and living organisms in general. In the first article stress was placed on the possible irritant effect of the vapours on the lungs; in the second no special emphasis was laid on the effect on the lung tissue.

It does not seem to be appreciated that the lung tissue may, apart from mere irritation, suffer serious damage as a result of actual contact with the vapour, apart from concentration in the blood.

Until quite recently knowledge of the function of the lung tissue was comparatively small, apart from the fact that the lungs were adapted for the supply of oxygen to the blood. The function of the bronchial muscles has been largely ignored and the physiology of the pulmonary circulation has been avoided, largely because of the experimental difficulty involved in its study and the negative results obtained by several well-known investigators. From book to book it had become quoted that the vasomotor mechanism in the lungs was negligible. Why there should be such an amount of muscular tissue in the lungs remained unexplained.

Much controversy centres round the action of adrenaline on the pulmonary circulation, as it is accepted that generally this drug acts only on tissues supplied by the sympathetic nervous system. While many observers have obtained negative or indefinite results, others, including Plummier, Starling, and Sharpey Schafer, have brought forward good evidence that adrenaline constricts the pulmonary vessels as it does the systemic. This suggests that the vessels have a sympathetic control, although in the light of more recent knowledge referred to below, this has not been reinvestigated.

By the introduction in 1919 by Sharpey Schafer of a convenient method of recording the pressure in the pulmonary artery new light has been thrown on the pulmonary circulation, and amongst the findings has been the fact that the effect of drugs which act on the circulation was greatly modified by anaesthetics.

I first noted that the effect of drugs on the pulmonary circulation would be much more easy to demonstrate on decerebrate animals, or animals under light ether anaesthesia, than on those anaesthetized with chloroform. For example, it was shown that the action of amyl nitrite on the pulmonary circulation can be prevented by deep anaesthesia. An investigation is in progress* to find out to what extent the functional activity of the lung tissue may be impaired by anaesthesia. It has already been shown that the action of histamine, now acknowledged to be a pulmonary constrictor (Dale and Laidlaw, Morris), may be similarly abolished.

There is evidence, too, that the action of adrenaline on the pulmonary circulation may be prevented while the systemic effect may be unaffected. This has occurred where all possibility of backward pressure through an incompetent mitral valve and cardiac effects have been excluded.

When the literature of the subject is surveyed it is found that the most probable reason for the negative or variable results of different investigators, largely in the days when chloroform was in more common use, was the effect of the anaesthetic. The effect of anaesthetics is not necessarily excluded in lung perfusion experiments, as the animal is under an anaesthetic immediately prior to death, and with the cessation of blood supply and anaesthetic the anaesthetic has all the better chance to produce its bad effects. In the positive experiments of Sharpey Schafer and of Starling, referred to above, volatile anaesthetics were not used except in the preliminary anaesthetization, but chloral and chloralose respectively.

This is not the first time that attention has been drawn to the action of anaesthetics on the lungs. In this JOURNAL, in 1880, McKendrick, Coats, and Newman described complete stoppage of the pulmonary circulation of the frog as the result of chloroform anaesthesia, with actual destruction of the lung epithelium.

When the evidence put forward by Flemming is considered, the importance of the local effects of anaesthetics on the lungs will be seen. He might also have added to his list the fact that a piece of muscle exposed to chloroform vapour is killed with great rapidity, a fact which is made use of in the thermopile experiments of Hartree and Hill on heat production.

My results so far agree with those of Flemming on isolated tissues. Recovery from the pulmonary effects occurs after ether, but after deep and prolonged anaesthesia with chloroform recovery is the exception. The actual death of tissue in the lungs as a result of the anaesthetic does not appear to be a remote possibility—indeed, may be easily considered the natural sequel. It is outside the scope of this paper to consider the evil results of such lethal action, but obviously the symptoms discussed at the Glasgow meeting might readily follow. That the absorption of toxic products from such dead tissue should produce delayed chloroform poisoning seems most reasonable.

Another function shown to be abolished is that of the bronchioles, which limit the amount of air passing in to the alveoli. Brodie and Dixon first demonstrated that the vagus no longer caused bronchiole constrictions under deep anaesthesia. The muscles or their nerve supply were considered to be paralysed by direct absorption of the anaesthetic through the mucous membrane. I have demonstrated that the action of adrenaline on the bronchioles may similarly be prevented by deep anaesthesia.

Now the abolition of the bronchiole function must necessarily throw a greater strain on the alveoli and cause them to be exposed to particles which otherwise would not reach them. Even if actual death of tissue does not occur, the mere loss of this protective mechanism temporarily must expose the lung to possible damage.

The investigation is proceeding, but from the results already obtained it is seen that the local effects of the common anaesthetic cannot be ignored, not only from the purely experimental standpoint, but also from that of the clinician. Although anaesthetics may be given to thousands of cases yearly without effect, it must be urged that we are still without an ideal anaesthetic for general use.

From the evidence given it is seen that deep or prolonged anaesthesia with ether, and especially with chloroform, should be avoided whenever possible. It is suggested that narcotics should be more extensively used to supplement volatile anaesthetics.

* The research is being assisted by a grant from the British Medical Association.

INTESTINAL OBSTRUCTION FOLLOWING ACUTE APPENDICITIS AND PERITONITIS.

BY

P. F. McFARLAN, M.B., CH.B., F.R.C.S.EDIN.,

SURGEON TO STIRLING ROYAL INFIRMARY.

IN the case here reported adhesions must have begun to form immediately after the first operation. The second operation was undertaken because of the increasing distension and in spite of the fact that there was no vomiting and that the patient's bowels had moved on the previous day. The part of the ileum opened on the fifteenth day was below the site of obstruction, which had been liberated at the second operation; the opening acted simply as a safety valve, and by relieving distension allowed the intestines to recover tone.

On February 6th, 1922, a man aged 20 was sent in to Stirling suffering from acute appendicitis. His illness had started suddenly thirty hours, approximately, before admission. When I first saw

him he had a temperature of 101° and a pulse of 112. He was very tender all over the lower half of the abdomen, and there was marked muscular rigidity. He gave no history of previous attacks, and in all other respects he was healthy and well developed. He was operated on a few hours after admission, and a gangrenous appendix with two concretions was removed. There was a considerable quantity of pus in the pouch of Douglas, and there was marked injection of all the peritoneal surfaces which came into view. A corrugated rubber drain was introduced into the pouch of Douglas. He was given normal saline and 6 per cent. solution of glucose alternately every two hours by the bowel, and morphine 1/2 grain on the first night. On the day following he was able to take liquids by the mouth and had no vomiting, so the saline and glucose enemata were stopped. His temperature came down to normal on the morning after the operation, and never rose again above 100°. His pulse came gradually down to 96 on the third day, and to 80 to 84 on the fifth day. The tenderness and rigidity also passed off in the first three days. In all respects he appeared to be making a good recovery, except that from the evening of the second day he began to complain of intermittent pain, of slight distension, and of a desire to have his bowels moved. Because of this constant demand on the part of the patient, on the evening of the third day he was given a small turpentine enema, which was returned coloured with a little constipated faecal matter. His distension continued slowly to increase, and his discomfort was more marked. He was given castor oil on the afternoon of the fourth day, and another turpentine enema. The bowels moved slightly that night, and they moved three times the next day, aided by 1/2 grain of calomel hourly up to 2 grains and another enema. Still the distension did not diminish and his discomfort was no less. He was given nepenthe mxv on the night of the sixth and seventh days. He still had no vomiting. His tongue by this time was dry and coated. His pulse remained at about 88, and his temperature never rose above 99°.

On the seventh and eighth days he had several small motions, mostly liquid, but his distension increased and also his discomfort, and owing to the distension the incision for the removal of his appendix stretched and broke down. Still no vomiting.

On the ninth day I opened the abdomen in the middle line and found the small intestine very much distended above a dense adhesion which bound the small bowel firmly to the mesentery of the pelvic colon. There were two other adhesions between the small intestine and the floor of the pelvis. These adhesions were all separated and the raw areas were covered over. A small quantity of pus was found in the pouch of Douglas. The distended bowel was all replaced in the abdomen, and I put a rubber drain into the pouch of Douglas, which was removed the next day. He had some sickness after this operation, and some dilatation of the stomach, which improved rapidly with gastric lavage. He was given pituitrin, and enemata, and castor oil by the stomach tube thirty hours after the second operation. The next day he had a copious liquid evacuation. He went on fairly well for a day or two, but never was quite comfortable and his distension did not diminish. Then he got worse again, and on February 21st—that is, fifteen days after the first operation—I opened the ileum, which was presenting at the original appendix incision, and stitched a small rubber tube into it. This tube drained freely at once and continued to do so for several days. His distension came gradually down and his bowels moved freely two days after. He made a slow recovery, being troubled with diarrhoea for some days, but he was able to go home six weeks after the date of his admission with all his wounds healed. By the third week of April he was wonderfully well. There was, however, a hernia at the site of the appendix incision.

Twenty years ago we were taught to give aperients and enemata to similar cases on the second day after operation. Now the practice is to withhold all stimulants to peristalsis either by the mouth or rectally till "convalescence is well established."[1] Mr. H. W. L. Molesworth,[2] in an excellent article on the after-treatment of acute abdominal disease, recommends giving no purgative till after the patient's bowels move, and he advocates a fairly liberal use of morphine. During the last two years or so it has been my practice not to give a purgative till the fifth or sixth day after operation. I give morphine readily for the first twenty-four hours; after that I try to avoid giving it.

We have had several cases of intestinal obstruction recently following pelvic peritonitis, and these cases have made me wonder if it is wise to withhold purgatives so long in all such cases. Is it not possible that by keeping the bowel at rest for six or seven days, with a fairly free use of morphine, we encourage the formation of adhesions and give them time to contract and so pave the way to intestinal obstruction?

REFERENCES.
[1] Keen's *Surgery*, vol. viii, p. 229. [2] BRITISH MEDICAL JOURNAL, February 11th, 1922, p. 218.

DR. ARNOZAN, professor of clinical medicine in the University of Bordeaux, has retired from his chair after having spent fifty years in the practice and teaching of medicine.

THE fifth Congress of the French Society of Orthopaedics will be held in Paris on October 12th. The subjects set down for discussion are: pes cavus; bone cysts, excluding hydatid cysts; congenital elevation of the scapula.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE CORRECTION OF MALPOSITIONS: THE RATIONALE OF THE PADDED BINDER.

IN using the method of the padded bandage to produce a favourable version or rotation the aim is to apply localized pressures in the same direction as we should choose for pressure applied manually. The difference is that by the pads the pressure is exerted with less intensity but over a longer time than by the hand. The mechanics of the problem is very simple. The binder applied in a circle exerts nearly equal inward pressure at each point of its course, but when pads are applied under it the inward pressures through the pads are greater. Being applied at opposite points of the child's body these pressures give the mechanical couple which is necessary if we are to produce a rotation. To obtain the greatest number of successes it is important to individualize the cases by selecting the most effective points for the placing of the pads and the best form of each pad for the application of pressure to the underlying part of the child's body, but the essential in every case is to secure two pressures which are in opposite directions at points as remote as possible from the line which is the axis of the rotation we desire.

Dundee. R. C. BUIST, M.D.

HYSTERICAL ELBOW.

THE case of hysterical simulation of fracture associated with hyperextension of the elbow-joint, recorded by Drs. H. C. Woodhouse and F. Carlton Jones (December 16th, 1922, p. 1171), induces me to publish the following similar case:

On May 6th, 1921, an intelligent girl, aged 14, applied to me for treatment at Bootle Borough Hospital. The history was that she had had a slight fall on some stairs and had struck the back of her right elbow, which at once became stiff and could not be flexed.

The elbow was found to be hyperextended to about 15 degrees, and the arm was rotated outwards, the forearm fully supinated, and the wrist and fingers extended. The patient complained of pain in the elbow-joint, but no sign of local trauma was found. When attempts were made to flex the forearm the triceps was felt to contract and the amount of contraction was found to vary with the force applied. The left elbow could readily be extended to a similar degree as the right, but no other joint possessed an abnormal range of movement. The patient volunteered the information that this was her first day in domestic service.

A diagnosis of hysterical elbow was made, and I proceeded to take a photograph of the condition. While adjusting the camera tripod I noticed that the gross hyperextension gradually disappeared, and that the forearm became pronated. Pretending that I was about to move her chair into a better light I seized the girl's arm, and—without difficulty and against no resistance—fully flexed the elbow.

On June 11th, 1921, the patient returned with a history that she had gone back to domestic service and had struck her arm again, when the condition had recurred. On this occasion there was less hyperextension, and the wrist and fingers were in no fixed position, but again the arm was rotated outwards and the forearm supinated. I suggested to the patient that the spasm would pass off when the pain from the blow had subsided. I persuaded the mother that the condition was hysterical, and she promised to show no sympathy: at the same time she was advised to find more congenial work for the girl. The patient did not again apply for treatment while I was at the hospital.

A. B. KEITH WATKINS, F.R.C.S.Eng.,
Clinical Assistant Surgical Out-patient Department, London Hospital.

THE ETIOLOGY OF OPTIC ATROPHY.

WITH reference to the report of the discussion on the etiology of optic atrophy at the recent meeting of the Section of Ophthalmology of the British Medical Association (JOURNAL, December 16th, 1922), and more especially with reference to Dr. C. O. Hawthorne's remarks on the neuritis of acquired syphilis, which he said was a very exceptional event in the early stage of the disease, the following case may be of interest.

A woman, aged 25, was seen in the Finger Klinik here a few days ago, when she showed a typical syphilitic leucoderma of a week's duration. Inquiry elicited the information that infection had taken place about four months previously. The cerebro-spinal fluid gave a positive Wassermann reaction. Three days later the same patient was encountered in the ophthalmological department, and then showed a typical acute double optic neuritis.

On the authority of Professor Kyrle, of the Finger Klinik, it can be stated that most cases of syphilitic leucoderma show

a positive Wassermann reaction in the cerebro-spinal fluid at the time when the skin lesions first appear—that is, in the secondary stage of the infection. This he takes as undoubted evidence of a syphilitic meningitis at this early stage of the disease. May it not be, then, that the optic neuritis which occurs in the early stages of acquired syphilis is to be regarded, not as an isolated effect of the syphilitic poison upon the optic nerves, but rather as evidence of a widespread involvement of the central nervous system in the form of a syphilitic meningitis?

WILLIAM L. TEMPLETON,
M.B., Ch.B.Glasg.
Vienna, Austria.

Reports of Societies.

INFECTION OF TEETH AND GUMS.

A DISCUSSION on the clinical, pathological, and radiological aspects of infection of the teeth and gums took place at the Medical Society of London on December 11th, 1922, with the President, Lord DAWSON OF PENN, in the chair.

Sir WILLIAM WILLCOX introduced the subject in a paper printed in full at page 53.

Professor J. MCINTOSH related particulars of his work, with Mr. Warwick James and Professor Lazarus-Barlow, on the isolation of a bacillus which they believe to be the cause of dental sepsis, and to which they have given the name of *Bacillus acidophilus odontolyticus*. He then briefly summarized present day bacteriological knowledge with regard to pyorrhoea alveolaris. The type of organism commonly associated with pyorrhoea was the streptococcus. Spirochaetes and amoebae had also been found, but he thought they did not play any etiological part. They were chiefly to be found in the grossly contaminated pockets and not in the deeper regions.

Dr. J. H. WOODROFFE gave an account of the *x* ray appearances attending sepsis, which he illustrated with some dental radiographs. He also touched on the relation between the doctor, the dentist, and the radiologist. The doctor was frequently anxious for more radical measures than the dentist thought desirable, and there was a tendency for the radiologist to be drawn into the controversy. He did not think that the radiologist should be expected to say what teeth should be extracted; this should be a matter for discussion between doctor and dentist.

Sir FRANK COLYER said that as a dental practitioner one of the most difficult things he had to decide was whether teeth should come out or not. What dentists wanted to know from the radiologist was whether the bone behind the tooth was deeply infected. Patients under 50 who were definitely suffering from general symptoms, and in whom the bone showed definite trouble, should without a doubt have their teeth extracted. The best results following the removal of dental sepsis in general conditions were in patients under 50 whose tissues had power to recuperate.

Dr. GEOFFREY EVANS gave an account of a case, to which Sir William Willcox had also alluded, in which a patient had malaise and irregular pyrexia due to septic teeth. The extraction of six teeth was followed by a profound streptococcal toxaemia. The removal of the remaining infected teeth was followed by a gradual disappearance of the toxaemic condition. He showed the blood picture obtained in this case, and indicated the changes in the differential count, which signified in some cases the absorption of poisons from dental sepsis.

Dr. WILLIAM HUNTER referred to the fact that in 1900 he read a paper before the Odontological Society of Great Britain on the relation of dental diseases to general diseases. The paper created a good deal of interest, largely because of the previous investigations by Professor Miller in Berlin, which had emphasized the magnitude of the infection and the variety of the flora. His own contribution drew attention to the foci of disease in the mouth which came under the direct observation of the physician. The present discussion was the first which had taken place on oral sepsis since the subject originated twenty years ago, in striking contrast to the keen interest shown in the United States. Since his original paper the *x*-ray method had made its appearance, but he hoped that physicians would maintain their own individuality and form an independent judgement without implicit reliance upon one piece of evidence such as an *x* ray picture.

Dr. P. WATSON-WILLIAMS, with his colleague Mr. W. R. ACKLAND, showed some stereoscopic odontograms, and spoke further on infections of the teeth and gums in relation to the ear, nose, and throat, which had formed the subject of a recent communication by him to the Odontological Section of the Royal Society of Medicine. The radiograph, he said, would show a good deal which was not to be discovered by other means, but it needed cautious interpretation.

Lord DAWSON, in closing the discussion, said that this subject afforded a very good example of the necessity for team work. What was wanted was some really connected work upon the subject to which dentists, radiographers, clinicians, and bacteriologists would all contribute; these should take a selected number of cases and follow them through. In spite of many interesting contributions to the discussion, the evidence available as to the effects of dental sepsis was extraordinarily thin. There was a great deal of sloppy thinking on this subject. Many members of the public now had had their teeth extracted, to the detriment of their appearance, and very often without benefit to their health. Hardly a week passed by without some example of the kind coming to his knowledge. One recent case was a young woman who had had her teeth taken out for scleroderma, without any benefit to her condition. If the teeth were definitely and markedly affected, the appropriate measures were, of course, called for; or if the patient was suffering from a febrile disease which had potentialities of evil it seemed a rational and proper proceeding cautiously to remove the teeth. But the cases in which he found difficulty were those of people with vague ill health—people who had no real illness, but were not quite up to the mark—or, again, people with an illness whose cause eluded the physician. There he saw grave difficulty in removing the teeth just on the chance that they might be the cause of the trouble. In very many cases there were no means of tracing the causal relationship to the teeth. He could not bring himself to believe that so many diseases as Sir William Willcox had enumerated could be produced by oral sepsis. He knew of no one cause which could produce so much. Sir William had even deprived port of its responsibility for gout! Were his catalogue justified the wonder was that a larger proportion of mankind were not diseased, or that, of the large numbers of people with oral sepsis, comparatively few got any of these diseases. Lord Dawson admitted that in rheumatism and other diseases there were striking examples of improvement following the treatment of oral sepsis—so pronounced that one was bound to say in some instances that this disease must be caused by oral sepsis. But in a large number of diseases ascribed to oral sepsis he believed that the direct influence of this condition was far less than it was now the custom to take for granted. Take duodenal ulcer: he did not believe that there was the smallest indication that duodenal ulcer was produced by sepsis of the mouth.

Sir WILLIAM WILLCOX agreed that every case should be approached with a critical mind. It was a great responsibility to advise the extraction of a patient's teeth, and there should be adequate local grounds for such extraction. Much yet remained to be done in finding the scientific proofs for the etiology of many of the common diseases he had instanced, and he agreed with Lord Dawson that there was no department of medicine in which team work was likely to be more valuable than in the investigation of oral sepsis.

SURGICAL TREATMENT OF RENAL CALCULI.

THE Section of Surgery of the Royal Society of Medicine on January 3rd held a discussion on renal calculi, more especially their surgical treatment. The President, Mr. JAMES BERRY, announced that Sir J. Thomson Walker was unable to take part owing to absence from London.

Mr. W. SAMPSON HANDLEY opened with a few remarks on the pathogenesis of renal calculi. From personal observation in two cases he was convinced that the first step in the formation of a calculus might be the appearance of a cyst in the cortical substance. In this cyst a calculus was deposited later, and came to light when the cyst ultimately ruptured into a calyx. He would not suggest that this mode of formation was frequent, but unless it was recognized the chances of overlooking a stone during operation were increased. He gave particulars of the cases he had seen which bore on this point, and showed a specimen (No. 3.618) from the museum of the Royal College of Surgeons of a kidney which, when split open, was found to contain a calculus wedged in the pelvis, while in the middle convexity of the kidney was an empty cystic cavity, ovoid in form, measuring 1 in. by 1/2 in. in section,

and communicating by a narrow oval opening with the dilated calyx which led down to the blocked pelvis. He believed that this specimen represented a late stage in the history of cystic calculus.

He then addressed himself to a review of the methods of removing stone from the kidney. He regarded the operation of nephrolithotomy or the splitting of the kidney as an unscientific procedure, to be reserved for kidneys with a very large calculus, and for cases in which, owing to a short pedicle or a deep loin, the necessary exposure for an incision into the renal pelvis could not be effected. In the last ten years he had only twice been driven by necessity to do a nephrolithotomy in preference to pyelolithotomy. Sir J. Thomson Walker, in his *Genito-Urinary Surgery*, adopted too detached an attitude in discussing the rival claims of nephrolithotomy and pyelolithotomy, and yielded too much territory to the former operation; but he made no doubt of his real preference for the second operation when he recommended it for removal of a stone from a solitary kidney. There was something to be said for a restricted nephrolithotomy. Hartmann of Paris had insisted that if upon exposure of the kidney a stone could be plainly felt in its substance and near to its surface, and the radiograph had shown the stone to be single, it was best to cut down upon it through the renal substance; the French surgeon declared that a small incision only was necessary, little damage to the kidney substance was done, and the operation had the merit of directness and simplicity. When a stone or stones could not be palpated externally some surgeons recommended that the pelvis should be reached by two incisions, one in the upper and one in the lower third of the kidney, opening the uppermost and the lowest calyx. The speaker did not believe, however, that free access to the pelvis could be obtained in this way, and the same objections applied to unipolar nephrolithotomy. In his belief the kidney should be explored by way of the renal pelvis directly. The cavity of the pelvis occupied to the kidney the relation of a manhole to a drainage system, and like the manhole could be opened and closed easily, without injury to the rest of the system. He read Thomson Walker's description of the technique for pyelolithotomy. Some surgeons, especially Hartmann, maintained that it was unnecessary to suture the incised pelvis, and Mayo also was said to have abandoned suturing. The insertion of a layer of sutures in the pelvis was certainly tedious, and increased the strain of the operation on the patient's vital powers. Nevertheless the firm, immediate, and accurate closure of the pelvis after incision was an end desirable in itself if it could be done easily and simply.

Mr. Handley then described a method of "subcapsular pyelolithotomy" evolved by him:

> The kidney, having been exposed by a lumbar incision, is brought up to the surface intact in its capsule. An incision about 3 in. long, and following the long axis of the posterior surface of the kidney, is made through the fibrous capsule. Two pairs of forceps are clipped upon the posterior edge of the incision in the capsule. While these are situated a pair of dissecting forceps is insinuated beneath the capsule in the direction of the pelvis until an entrance to the hilum of the kidney is reached. Here the capsule, or one layer of it, leaves the kidney and passes on to the posterior surface of the pelvis. The forceps or dissector enlarges the pocket formed beneath the capsule until, at its bottom, the line of entrance of the pelvis into the substance of the kidney is reached. A knife is now taken, and with its point the posterior surface of the pelvis is cautiously incised at the bottom of the capsular pocket in the long axis of the kidney. The forceps, or if necessary the finger, can now be introduced into the pelvis, the stones present in it removed, and the opened recesses explored. When the opening in the pelvis has served its purpose it can be completely and rapidly closed by three stitches uniting the edges of the original incision in the capsule on the posterior surface of the kidney.

He had performed this operation in nine unilateral cases of renal calculus and in two bilateral cases. In all of them the calculi were small and lay in the pelvis or in the calyces, from which they could be extracted by way of the pelvis. In none of the cases did any complications arise. In dealing with a compound branched pelvis, instead of opening the main pelvis one might possibly open the two branches, and so be confronted with two cavities instead of one, which would add to the difficulty of the operation; but his subcapsular method had the advantage that the flap, which was common to both cavities, would of itself reconstitute the pelvis when placed in position. He also emphasized the value of digital examination. For certain purposes in surgery the gloved finger, gently used, was not merely the safest but the only instrument to supply the necessary information.

Mr. FRANK KIDD was glad that Mr. Handley had emphasized the danger attending the splitting of the kidney—a procedure which should hardly ever be needed. When it was done it should only be after the blood vessels had been controlled temporarily. Most urinary surgeons nowadays had adopted the method of using a finger in the pelvis and a finger on the surface of the kidney, in preference to splitting the kidney. Great help could be afforded by exploration with the finger. The danger of secondary haemorrhage after the splitting was very considerable. Often the patient did not bleed so much at the time, but when the catgut ligatures separated about the tenth day very severe secondary haemorrhage might occur. He thought Mr. Handley's subcapsular method, if taken up at all generally, might lead to accidents. Mr. Handley had carried it out in only a few cases; if done in a hundred cases he believed it would be found that in perhaps 5 or 10 per cent. serious haemorrhage occurred from an artery which came down from the top of the kidney posteriorly, and often ran very low. He himself believed that the longitudinal incision in the pelvis, as described by Thomson Walker, was the safer for routine purposes. The danger of fistula after pyelolithotomy he believed to be entirely misconceived. Fistula followed only when some of the stone was not removed. A little bit of the stone might be broken off and get into the ureter, blocking it and causing fistula. Urinary surgeons had tried at various times to apply x rays to the operating table. He had been lately in America, watching the Mayos, who had at last got an x-ray apparatus which worked satisfactorily (though not without occasional danger) on the operating table, so that fluoroscopic examination of the kidney was possible at the time of operation. It was rather disconcerting to find how often the x rays showed that all the stone had not been removed. He doubted whether, without some means of combining x-ray examination with the actual operation for stone in the kidney, justice was done to the patient. For bilateral calculus he believed that both kidneys should be incised at the same operation.

Professor F. HOBDAY, speaking from the veterinary point of view, said that renal calculus was common in animals, and as some animals were herbivorous only, some carnivorous only, and some omnivorous, there was scope for interesting observation. Renal calculi were found in the horse, the dog, the cow, the sheep, and the pig. In the horse this condition was quite common; sometimes the involvement was such that nothing was left of one kidney but the mere capsule. As long as one kidney was functioning it was remarkable how long the animal could go without showing any outward indications. The same held true of the dog. In the sheep, pig, and cow the calculi were observed less commonly, but this was probably because these animals did not live the long lives of the other two. The condition was met with chiefly in old or at least in adult animals, though not exclusively, for he had had a case of calculus (in the urethra) in a puppy four weeks old. In a large canine practice in London he saw twenty or thirty cases every year. If an operation was done, the procedure generally was to remove the diseased organ. Radiography had been of the greatest service, and with an animal suffering pain in the region of the kidneys, even though it had not haematuria or any other indication of stone, it was the common practice to obtain a radiograph.

Mr. J. SWIFT JOLY said that he endeavoured in each case to select the operation which would do least damage to the kidney. No rigid rule could be proclaimed as to the relative merits of nephrolithotomy and pyelolithotomy. Much depended, to begin with, upon the patient's physique. In a fat person, with a thick abdominal wall, the kidney perhaps could not be got sufficiently out of the loin to do pyelolithotomy with safety. Again, the relative size of the stone to the renal pelvis was a factor to be taken into account. If a stone was definitely in the renal pelvis not extending up into the calyces a pyelolithotomy could almost always be done, provided the kidney could be brought out of the loin. There was no real limit to the size of the true pelvic stone which could be got out through the pelvis. Recently he removed two stones from a kidney pelvis through a pelvic incision, the larger stone being about the size of a hen's egg and the smaller about the size of a cherry; but the patient had a dilated pelvis, and it was easy to get them out. But when, owing to branching, the stone involved calyx as well as pelvis it was not always possible to get it out through the pelvis, and to attempt that operation was to do more damage to the kidney than by making a clean cut through the kidney itself. When there were stones both in the pelvis and in the calyces the line of conduct would be governed chiefly by the amount of dilatation of the pelvic-calyx system. If the

kidney was dilated and the pelvis and all the calyces dilated, these stones could be got out through the pelvis quite comfortably; but if, as often happened, though the pelvis was dilated, there was a very narrow opening between pelvis and dilated calyces, he thought it wrong to try to enlarge that opening either by dilatation or by cutting through the pelvis. It was much safer to cut through the cortex in such cases, and while taking the pelvic stone out through the renal pelvis to take the smaller stones out by way of the cortex. He went on to consider the methods of exploring the kidney in those uncertain cases in which the *x* rays showed a small shadow, whose exact position was uncertain, and nothing was very palpable. Generally the *x* rays gave a good idea of the locality of the stone, and this greatly simplified the operative technique. But if quite in the dark as to where the stone was the rule he followed was first to look at the renal pelvis. With a big pelvis, extending well out from the kidney, he opened it and passed his little finger in and explored the calyces one by one. If he could find nothing there he made an incision over the lower third of the kidney and cut down on the lower calyx. One was given a much more direct line of action from the cortex downwards than from the pelvis upwards. This plan of exploration could be continued, but it was rarely necessary nowadays, for usually the surgeon was able to have a map of the position before he started.

Mr. H. W. WILSON said that if the kidney cortex was opened the danger of secondary haemorrhage was always to be feared. Yet the surgeon could not deal effectively in all cases by working through the pelvis, and he was bound to leave stones behind if this were attempted; but the secondary haemorrhage which followed the other course was very serious, and he desired to know from his colleagues whether they were aware of any means of averting it.

Mr. R. H. J. SWAN agreed with all the speakers that a perfectly open mind must be kept as to the kind of operation to be performed. In the great majority of cases, when the surgeon had got the kidney thoroughly exposed, the line of procedure would be perfectly obvious. Secondary haemorrhages after nephrolithotomy were very serious, and he had had to do a nephrectomy to save the patient's life. At the same time he was convinced that not every stone could be removed through the pelvis. Each case must be studied separately. He added that he had never seen a urinary fistula occurring after a pyelolithotomy.

Mr. J. E. ADAMS had found a transverse incision extremely satisfactory. He imagined that Mr. Handley had adopted the incision he described because he thought it might facilitate the healing of the wound in the pelvis of the kidney, and therefore obviate the risk of fistula. He believed the transverse incision would answer to these requirements. If the stone was large the transverse incision would necessarily be large.

Mr. SAMPSON HANDLEY, in reply, believed that members who tried the subcapsular method would discover its practical advantages. His own belief was that the posterior branch of the renal artery was pushed out of the way with the capsule; he had had no trouble from that source. In his operation the flap of the capsule guided the operator down to the line of the hilum so that he could see where the incision should be made. He could not help feeling that sometimes the severity of the double operation for bilateral calculus would be more than the patient could be expected to stand; it should be reserved for the earlier cases. The dangers of secondary haemorrhage had been alluded to; he had found vaseline gauze useful in one case to stop persistent bleeding from the kidney substance, and this might sometimes prove more efficient than sutures. He had never tried the transverse incision, which was likely to cause increased haemorrhage.

CLEAN MILK.

AT a meeting of the Liverpool Medical Institution, held on December 21st, 1922, with Mr. C. THURSTAN HOLLAND in the chair, Dr. DOBBIN CRAWFORD read a paper on the subject of clean milk. She said that America was the pioneer of the clean milk movement, but it was in England that the National Clean Milk Society was founded in 1915 with the following objects: (*a*) To examine the condition of milk as received by the consumer. (*b*) To furnish a standard of clean milk. (*c*) To create a demand for clean milk. It was found in 1915 that the average sample of London milk contained more than 3,000,000 bacteria per cubic centimetre—rather in excess of the number of bacteria present in the city sewage! Tubercle bacilli were present in 10 per cent. of the samples and over 99 per cent. contained *Bacillus coli*—absolute evidence of contamination with manure. A standard of clean milk was furnished in the licences issued by the Ministry of Health in 1921 for the production of certified Grade A milk, which must contain no tubercle bacillus, no *Bacillus coli*, and not more than 30,000 bacteria per cubic centimetre at any time before reaching the consumer. It must be delivered within two days after the day of production. Every animal in the herd must be examined by a veterinary surgeon and give a negative reaction to the tuberculin test at intervals of three months.

Dr. Crawford quoted the following statistics of Liverpool milk from the report of the Public Health Department:

> Of 943 samples examined in 1921, from 9 to 15.6 per cent. contained tubercle bacilli. The veterinary inspectors in 1921 found 31 cows with tuberculosis of the udder supplying milk to the city. From 80 to 90 per cent. of the samples tested contained *Bacillus coli*, and in that year diarrhoea and enteritis killed 683 infants in Liverpool.

The practical effect of grading milk was to raise rapidly the standard of the whole milk supply; it tended also to increase the consumption of milk. The cost of certified milk was 7½d. a pint, just double that of ordinary milk. The need of the moment was the education of the consumers, so as to increase the demand for clean milk. Dr. Crawford showed lantern slides to illustrate clean methods of production and their effect. These were taken at the Storms Farm Dairy, Keswick, from which she had received certified milk during the past year. The reports of this milk by the Ministry of Health showed that when seventeen to eighteen hours old it contained no *Bacillus coli*, and an average of only 242 bacteria per cubic centimetre. She had persuaded a dairyman in Wallasey to retail this milk, but, owing to lack of demand, it was not procurable in Liverpool.

Dermatitis in Bakers.

Dr. OSCAR DE JONG read a note on the etiology of dermatitis in bakers. Dr. de Jong said that bakers' dermatitis occurred in bakers employed in bakeries where the hands are used in mixing, not in bakeries where machines are used. Investigations showed that the flour used was not responsible, as no cases of dermatitis were found in men employed in flour mills who were constantly handling flour. Similarly, no cases were found in men handling or preparing yeast. The condition was due to immersing hands and arms in the salt solution added to the flour, which was about 3.6 per cent. in strength. Owing to the temperature of the bakehouse and the ovens the salt crystallized on the arms of the workman, and the process of kneading worked the crystals into the skin, setting up a dermatitis in susceptible individuals. Cure was obtained by rest from work and local treatment. Dr. de Jong concluded his note by suggesting prophylaxis by the use of a spray of fresh water after mixing the salt solution and at periods during kneading. The condition relapsed as a rule on return to work.

Dr. FRANK H. BARENDT alluded to the terminology of this affection, and showed that it was well known in bygone ages. He emphasized the fact that the proportion of those suffering from bakers' itch was but slight. In spite of the number of possible excitants and a too vigorous use of soap and water in ablution that should not be overlooked, one was compelled to admit the presence of idiosyncrasy. Dr. Barendt considered that nevertheless all the necessary preventive measures to which Dr. de Jong had drawn attention should be taken, and every case should be treated *sui generis*.

"Acute Abdomen" in the Child.

Mr. W. A. THOMPSON read a paper on the acute abdomen in the child, based on 100 consecutive cases. These included 53 cases of acute appendicitis, 15 of which had general peritonitis; of these, 5 died. There were 27 intussusceptions, the great majority occurring between the fourth and eighth months; 21 recovered, 6 died, three following resection and lateral anastomosis, one of which lived nineteen days, and one case, moribund on admission, died soon after reduction had been performed. The reduction should be intra-abdominal. Many cases were associated with enlarged ileo-caecal glands, some of which were connected by bands to the gut immediately in front of the original apex of the intussusception. Mr. Thompson explained how these might cause an intussusception, and how a much enlarged gland caused a recurrent

incipient intussusception. The majority of cases commenced as ileo-ileal—66 per cent. Of 8 cases of acute intestinal obstruction operated on 5 recovered; 3 cases of strangulated hernia had been met with in over 1,000 of Mr. Thompson's cases; they all recovered.

MILITARY SERVICE AND HYGIENE.

A MEETING of the Naval, Military, and Air Force Hygienic Group of the Society of Medical Officers of Health was held on December 1st, 1922, when the President, Major-General Sir WILLIAM MACPHERSON, K.C.M.G., delivered his presidential address on "The influence of military service on hygiene." By historical outline he showed how some indication could be gathered of the influence that military service had brought to bear on questions of health preservation and prevention of disease. Maintenance of physical fitness, physical training, hygiene of the march, relationship between food and energy, hygiene of clothing, camp sanitation and all it implies (such as water supply, camp sites, hospital accommodation, barrack rooms lighting and ventilation, etc.), prevention of specific diseases, and education of the individual in sanitary habits, were all dealt with in turn. The President referred to the workers of ancient times, such as the numbering of the men by Moses "from 20 years old and upwards, all that were able to go forth to war"; to Vegetius in the fourth century A.D., who laid stress on the graduated training of men; to the sports and exercises of the ancient Greeks; and to the care of bodies as advised by Alexander the Great for obtaining and preserving physical fitness. Mention was then made of the more recent pioneers, such as Sir John Pringle, Robert Jackson, Edmund Parkes, and Lieut.-Colonel Garrison of the U.S. army. Lastly, Sir William Macpherson's references to the preventive investigations of David Bruce and Horrocks in regard to Mediterranean fever, of Almroth Wright and Leishman in regard to inoculation against enteric fever, of Manson and Ronald Ross in regard to malaria, and of the workers on cerebro-spinal fever in the recent war, brought a most instructive address to a close.

Lieut.-Colonel H. R. KENWOOD, who occupied the chair, expressed the regret of those members who were unable to be present, and the meeting concluded with a cordial vote of thanks to the President, proposed by Surgeon Rear-Admiral Sir PERCY BASSETT-SMITH, and seconded by Major-General W. W. O. BEVERIDGE.

BLUE SCLEROTICS AND MULTIPLE FRACTURES.

A MEETING of the Midland Medical Society was held in the Birmingham Medical Institute on December 20th, 1922, when the President, Dr. PURSLOW, took the chair, and about forty members were present.

Mr. A. W. NUTHALL showed the cases of a father and two daughters, who exhibited the combination of blue sclerotics and multiple fractures. Mr. Nuthall shortly reviewed the literature of this interesting condition. The father had over thirty fractures, and both daughters had fractured several bones. These cases were discussed by Dr. A. P. THOMSON, who knew of four families exhibiting the same symptoms. He stated that in these cases the fractures were more frequent up to the age of 10 years, and after that age became much less frequent.

Paroxysmal Tachycardia.

Dr. EMANUEL showed a man of 52 who for some years had suffered from attacks of a rare form of paroxysmal tachycardia.

In the attacks, which lasted from two or three hours to three or four days, the pulse rate was slow—34 to the minute—and consisted of runs of 2, 3, 4, or 5 regularly spaced beats at a rate of 82. These runs were separated by pauses of three to seven seconds in which no beats were felt at the wrist, and no heart sounds were audible over the praecordium. The electrocardiogram showed that the silent pulse periods corresponded to paroxysms of ventricular extra-systoles arising in the right ventricle at the rate of 173 to the minute, as many as 17 being counted in a single paroxysm. In the paroxysm the ventricle drove the auricle with a reversed heart-block of 2 to 1 and sometimes 3 to 1. During the intervals between the attacks the pulse was regular, at a rate of 60 to 66 to the minute. Dr. Emanuel said that Dr. Hart described a similar case in *Heart* (1912-13, vol. iv, p. 128). Those cases were clinical counterparts of the paroxysmal tachycardia experimentally produced by Sir Thomas Lewis by ligature of the right coronary artery, described in *Heart* (1909-10, vol. i, p. 98).

Dr. Emanuel's case was discussed by Dr. BUNTING, Dr. WILKINSON, and Dr. MELSON.

Pasteurization of the Milk Supply.

Dr. JOHN ROBERTSON, medical officer of health for Birmingham, read a paper entitled "The pasteurization of the milk supply in Birmingham," and emphasized the following points. About 75 per cent. of the milk supply in Birmingham was at present pasteurized or sterilized in order to prolong the life of the milk. Several firms sterilized milk in bottles. Milk should be efficiently pasteurized, then cooled to a temperature of 40° F. and bottled in a bottle which had been sterilized. Such milk was safer than any other variety of milk, pathogenic organisms of tubercle, enteric fever, scarlet fever, sepsis, etc., being killed. No contamination could take place until after the bottle had been opened in the consumer's house. Probably less damage to vitamins was caused than by nursery heating. The keeping properties were also better. Because the milk was clean and of good quality and safe more milk was used. Dr. Robertson's paper was discussed by Dr. MELSON and Dr. ROBB.

UNSATISFACTORY APPENDICECTOMY.

AT the meeting of the Section of Surgery of the Royal Academy of Medicine in Ireland, held on December 15th, 1922, with the President, Sir W. DE C. WHEELER, in the chair, Mr. W. DOOLIN, in a paper on "Some unsatisfactory appendicectomies," said that the so-called appendicular dyspepsias cover a varied group of living pathological changes, whose differential diagnosis is not always easy. For many of these patients appendicectomy, whilst technically easy of accomplishment, failed to relieve symptoms; further, many appendices were removed without sufficient pathological justification for the operation. In the out-patient department at St. Vincent's Hospital, of 29 patients who had undergone appendicectomy, either there or elsewhere, for the relief of "chronic appendicitis," 20 had been completely relieved of their symptoms by the operation, but in 9 cases symptoms persisted after operation. The majority of the unsatisfactory results were in females. Eight of these were admitted to hospital for further study, and a second operation showed the continuation of trouble to be due in 3 cases to caecum mobile, in 3 to tubercle, and in 2 to pericolitis. Detailed notes of the cases were given. A common pre-operative syndrome was to be found in the case histories presented by these patients, consisting of indigestion, constipation, inconstant pains situated below or to the right of the umbilicus. Tenderness over McBurney's point was inconstant; in many women painful flatulence was the dominant complaint. The whole symptom complex was an unsatisfactory one upon which to recommend appendicectomy offhand. Other observers, notably Gibson of New York and Enriquet of Paris, had reported anything from 25 to 40 per cent. of bad end-results following appendicectomy in such cases.

Four different conditions might be found responsible for such symptoms: (1) Chronic appendicitis, secondary to an acute attack, which was relieved without operation; (2) appendicitis chronic from the start, and unassociated with other intra-abdominal pathological change; (3) chronic appendicular pathology accompanying pathological changes in stomach, duodenum, gall bladder, etc.; (4) lesions of ileum, caecum, and colon, such as Lane's kink, mobile caecum, caecocoloptosis, pericolitis. It was not justifiable to recommend operation on the case history and clinical examination alone in such cases; before operating on an alleged "chronic appendix" a complete abdominal diagnosis should be made, based on combined clinical, *x*-ray, and haematological findings, as recommended by the Paris school of surgery. In the author's opinion, the McBurney "gridiron" incision was responsible for many incomplete operations, and should not be taught to students. A large incision, properly placed and cared for, would heal just as quickly, and throw more light on the living pathology under the operator's hand.

The PRESIDENT remarked that there was very little to be learnt from operative success, but a great deal to be learnt by mistakes. He disliked the term "appendix dyspepsia." Mr. Doolin had mentioned exploratory laparotomy. The President said that it was his custom to exhaust all possible aids to diagnosis before operating, and to make at least a provisional diagnosis before opening the abdomen.

Mr. CHANCE said that, in view of the accepted fact that the diagnosis of chronic appendicitis was not to be made with certainty from the clinical findings, the history of the case, or the *x*-ray findings, an exploratory laparotomy was not, in his opinion, infrequently necessary. Dr. CROFTON was

not surprised that so many failures occurred, as in a great many cases no thought was taken of the infecting organism.

Mr. MCCONNELL considered that the end-results in cases of this sort were not sufficiently studied. If an operation was not indicated, it would do no good; in fact, it would probably do harm. If the diagnosis of a case was not known before operation, he was of opinion that it would not be known after operation. At operation it was sometimes difficult to know whether the appendix had given rise to the symptoms or not. It was not an abnormal appendix unless some definite lesion was found when the abdomen was opened. He did not believe that *x* rays were of any use in detecting chronic appendicitis. In cases where a distended caecum was found, it was of great importance, and should not be ignored. He thought that Mr. Doolin's suggestion of examining patients under a screen, instead of by isolated *x*-ray plates, was very important, as in this way a much better idea of the case was obtained. There should be much more definite co-operation between the physician, the surgeon, and the radiologist.

Dr. SPEARES had had a number of such patients *x* rayed, but had not got much help in this way, except in one case, in which but for the radiologist a serious blunder would have been made. He agreed that there should be more co-operation between the physician and the surgeon; the physician had usually kept the patient under observation for some time, and so had the advantage over the surgeon in making a diagnosis.

Reviews.

WAR BLINDNESS.

THE character of the blindness caused during the war differs considerably from that found amongst the civilian population owing to the high incidence of injury. Sir ARNOLD LAWSON has done good service in collecting details of the cases that passed under his hands at St. Dunstan's: the little book on *War Blindness*[1] which he has published gives a well balanced and interesting account of his observations.

The grand total of cases of persons blinded directly or indirectly as the result of the war, estimated eighteen months after the armistice, was 1,833 men of all ranks. The comparison between the relative number of cases of disease and wound blindness shows that disease was responsible for a little more than 26 per cent. of the total number, a proportion which is appalling enough, and for which syphilis was very largely responsible. Besides the totally blind there were a number of cases of men with indifferent but useful sight who, as the fame of St. Dunstan's spread abroad, were anxious to press their claims to twelve months' hospitality without charge, and lastly a number of pure malingerers who scented pension and St. Dunstan's and whose cunning in dissembling engaged all the skill of the detective abilities of the institutional authorities.

A study of traumatic cases brings out a few general facts. Of first interest is the notable absence of sympathetic inflammation. The author did not see a single case of sympathetic disease occurring in the other eye after the smashing of one eye by shell splinters or bullet wound. A few cases were seen after some operative treatment had been carried out on one eye. He suggests that the missiles, shell or bullet, are absolutely aseptic when striking an object; it was very interesting to note how quickly and cleanly eyes would heal even after wounds of the most destructive character. At first his inclination was to remove blind stumps, but the refusal of some to submit to operation led to the observation that there was no untoward sequel, so that later cases were left untouched.

An interesting observation was that the number of cases of rupture of the choroid was large. Ruptures were often multiple, and varied in shape and position, though only three cases of solitary rupture to the inner side of the disc were seen. It would seem that there may be some element of the choroid especially liable to split, for a large number of cases showed no injury to the eye beyond the rupture, accompanied by neighbouring concussion changes and other choroidal atrophy. The direction of the blow disturbing the eye seemed immaterial to the result. There were a large number of cases where both eyes were destroyed by through-and-through penetration of the bullet. Usually the bullet took the horizontal line of the temples. Occasionally one eye would suffer less complete damage, or part of the nerve might escape. In this way 17 per cent. of the traumatic cases were accounted for, and this suggests the desirability of improvement in the steel helmet. A brim a little broader and more obliquely set would add little to the weight and would improve the protection. Fractures of the skull accounted for many cases. Those in the region of the occiput produced a variety of field disturbances. Rarely the central field might be undamaged with a vision of 6/5, but the narrowness of the field made this acuity useless; a good field and little or no macular is infinitely more useful.

Blindness from disease was in very many cases the accentuation of existing defects. This leads the author to observe that it is not advisable to accept for active service any man whose defective sight in both eyes is due to old inflammatory disease of the uveal tract. No matter how quiet the eyes may be, or for how long a time disease has been stationary, old inflammatory mischief is always apt to recrudesce under conditions inimical to general health. If a careful ophthalmoscopic examination of all suspicious cases had been made a large number of cases of active congenital disease, such as retinitis pigmentosa or other forms of fundus disease, would have been refused, and the State would have been saved disability pensions amounting at the present time to many thousands of pounds a year. The appalling share of the total number of cases of blindness due to disease which must be allotted to syphilis will, it is hoped, have some little effect in stirring public opinion to force more attention to the subject.

[1] *War Blindness at S. Dunstan's.* By Sir Arnold Lawson, K.B.E., M.D., F.R.C.S. Oxford Medical Publications. London: Henry Frowde, and Hodder and Stoughton. 1922. (Demy 8vo, pp. 148. 7s. 6d. net.)

TYPHUS FEVER.

IN their book on *Typhus Fever, with Special Reference to the Russian Epidemics*,[2] Captain J. M. MITCHELL, Dr. I. N. ASHESHOV, and Mr. G. P. N. RICHARDSON, who were all formerly attached to the British Mission to Denikin's army in South Russia, give an account of the main features of typhus fever based on their experience of the disease in that country in 1919–20. The first chapter is devoted to a consideration of the cause and prevention of typhus, including a description of the epidemic following the retreat of Denikin's army. In the second chapter, which contains an account of the clinical course of the disease and of its most frequent complications, it is stated that complications may be considered to some extent as an index of the efficiency of the nursing; with capable nurses under favourable conditions the rate of complications should be low, while with an inefficient nursing staff under unfavourable conditions, as occurred in many of the Russian temporary hospitals, the rate of complications is high. In the third chapter, which deals with the general treatment of typhus, it is said that if delousing is efficiently done cases of typhus may be treated in the general medical wards without fresh cases arising.

The last two chapters, which are written by Dr. Asheshov, are concerned with specific treatment and preventive inoculation respectively. Specific treatment is considered under the three headings of chemiotherapy, including salvarsan, mercury, etc., specific serotherapy, and protein therapy. The results of chemiotherapy, it is shown, are negative. Salvarsan and its derivatives are not only useless but dangerous, and mercuric cyanide and calomel, which were once regarded as specific, are now abandoned as ineffective. The use of the serum of typhus convalescents was also disappointing; although a general improvement in the patient's condition ensued, no great influence on the temperature and no marked shortening of the duration of the disease was observed. Dr. Asheshov attaches most value to the use of foreign proteins, including bacterial proteins, milk, or serum. As the presence of toxins cannot be excluded in the case of material derived from bacteria—and it is impossible to be sure of sterility in the case of milk owing to the frequent presence of spore-bearing organisms—horse serum in the form of normal horse serum, diphtheria or tetanus antitoxin, or antistreptococcic serum should be preferred. After a desensitizing dose of 0·5 to 5 c.cm., increasing doses are given, "20 c.cm., 40 c.cm., and even up to 80 c.cm., every day or every other day." Although the treatment does not shorten the disease, it has a distinctly stimulating effect on the circulatory and nervous systems. Cases so treated had rarely, if ever, any complications or sequelae. Preventive inoculation was performed by

[2] *Typhus Fever, with Special Reference to the Russian Epidemics.* By J. M. Mitchell, O.B.E., M.B., Ch.B., I. N. Asheshov, M.B., Ch.B., and G. P. N. Richardson, M.B., B.Ch. London: Baillière, Tindall, and Cox. 1922. (Demy 8vo, pp. 48. 3s. 6d. net.)

subcutaneous or intramuscular injection of sterile defibrinated blood taken from a typhus patient free from any other disease (especially tuberculosis and syphilis) between the fourth and eighth days of illness. The protection conferred by this method was shown by the fact that of 195 members of the British Mission who had been completely inoculated only one developed the disease, whereas among the uninoculated the incidence was from 9 to 10 per cent.

The book contains much interesting information which is of special value as being the outcome of first-hand experience of the disease in circumstances, it is true, particularly unfavourable for elaborate clinical or pathological observations. We have noted, however, two omissions. In the first place, we should have expected at least a passing reference to the recent investigations on the pathology of the disease, which have clearly proved that typhus is a systemic disease of the small vessels. Secondly, although Plotz's bacillus is mentioned in two places, no allusion is made to *Rickettsia prowazeki*, which has greater claims than any other organism hitherto described to be regarded as the causal agent of typhus (vide BRITISH MEDICAL JOURNAL, June 17th, 1922, p. 956).

A TEXTBOOK OF ANAESTHETICS.

THE appearance of a new work by a well-known writer on subjects connected with the anaesthetic art, larger in scope and more complete in detail than anything he has hitherto published, cannot fail to elicit, among those interested in the subject, a certain pleasurable expectation, not unmingled with curiosity as to how his efforts would compare with those of others whose books have already become established as textbooks of anaesthesia. Dr. BLOMFIELD, in his textbook of *Anaesthetics in Practice and Theory*,[3] modestly eschewing a preface, either of his own or other person's writing, plunges direct into chapter i, which he entitles "Introductory and Historical"; in it he defines the purpose of his labours, which is "to succeed at least in helping those who are beginning to practise this branch of medicine, and to interest those who have already gained experience."

After careful perusal of this well printed, well illustrated, and eminently readable volume, it may be said at once without reserve that the author has succeeded in the task which he has set himself. The book is free from all useless padding, but this result has not been achieved at the expense of adequate description either of methods, apparatus, or of choice of anaesthetics. The inclusion of a number of cases illustrative of the particular points the author wishes to bring out increases the general interest of the text as well as impressing facts on the mind of the reader. The physiology of anaesthesia with regard to the various anaesthetic agents employed is adequately, and at the same time interestingly, dealt with, useful important work on these points being noticed and briefly commented upon. The practical aspects of the subject are clearly set out, and the choice of anaesthetics, of apparatus, and of methods of administration are explained lucidly, and without personal bias. In fact, it would not be easy to hazard a guess as to which particular piece of apparatus or which method of administration of any one anaesthetic is the favourite of the author, and this is perhaps as well in a textbook which aims at teaching not only the student but the practitioner. The advantages and disadvantages of each method are set forth clearly, and a good explanation given of each type of apparatus in common use. Nor are the more complicated methods of administration neglected, though in this case the reader is referred for details to the original papers and monographs. Chapters are included on the preliminary use of narcotic and other drugs, on the posture of the patient and its bearing on anaesthesia, on undesirable conditions of the patient during anaesthesia—their causation and treatment, on accidents and complications that may follow anaesthesia, on unusual uses of anaesthesia, on local analgesia, and on spinal and sacral analgesia. In his chapter on the fatalities of anaesthesia the author makes a well founded protest against the present custom of some coroners' courts, by which inquests are held only on those dying on the operating table, whereas in the case of those dying later in bed as the result both of operation and anaesthetic no such inquest is held. The result is to make the public believe that all deaths on which an inquest is held are due to the anaesthetic, whereas it is quite possible that the anaesthetic was not even the principal cause of the fatality.

Altogether this is a book that can be confidently recommended to the student, and to the practitioner who is not in search of an encyclopaedia of anaesthesia. We may suggest that in a future edition reference should be made to Phillips's modification of Hewitt's air-way, which is a distinct improvement on the original, and to the apparatus devised by Loosely for the administration of ethyl chloride, which is very satisfactory for use in hospitals. Induction is rapid and uniform, and the patient is able to breathe air while getting used to the feel of the facepiece; this in children tends to diminish struggling prior to loss of consciousness; the instrument has the further merit that it is readily cleansed.

POST-OPERATION TREATMENT.

MM. ROCHARD, surgeon to the Paris hospitals, and W. M. STERN, another surgeon trained in Paris, have written a book on the general care and nursing of patients after operations, and on medical and surgical treatment of the complications which may occur.[4] It is directed to meet the wants of a house-surgeon at a general hospital, where the engagements of the surgeon prevent him from afterwards attending on the patients upon whom he has operated. Instruction and the examination upon what is taught tends, it is said, to become more general and theoretical, because those actually practising surgery take less part in teaching. Their attention being directed to pathology and diagnosis, students learn little of what happens after the operations, for their attendance in the wards is interrupted by the increasing number of classes. Thus a nurse has far more opportunities of learning about post-operative treatment and complications. Incidentally the book is generally of interest because it supplies indirectly information as to the practice of surgery in a Parisian general hospital. The illustrations are remarkable because there are a number of clever sketches, with a ward orderly to represent the patient; the resident surgeon wears a skull-cap on the top of his head, and has a beard; masks and gloves seem out of fashion. The very young nurses have a fringe of hair protruding under their kerchiefs. Some of the drawings provoke a smile—for example, a nurse and orderly washing out the stomach, a man sitting on the side of his bed stark naked, feeding himself through a gastrostomy tube, and the vigorous methods of compressing arteries by the surgeon. Under general headings we find notes on the treatment of the complications following inhalation and spinal anaesthesia, artificial respiration being described under spinal anaesthesia by novocain. There follows a full account of the treatment of sepsis and haemorrhage. Under special headings, in which there are of necessity repetitions, we note that what is included mainly relates to the surgery practised on acute and urgent cases in a general hospital. The after-treatment of cases in special hospitals for eye cases and for children is not included; thus we miss accounts of the after-treatment following removal of tonsils and adenoids, of tracheotomy for diphtheria, and of the orthopaedic treatment of deformities. On the other hand, there is a full account of the after-treatment of gynaecological cases.

JUVENILE DELINQUENCY.

THOUGH there is now a tendency to regard the juvenile offender against the law as a patient to be treated rather than a criminal to be punished, the social mechanism for dealing with these cases is still very inadequate. As a contribution to this problem Dr. H. H. GODDARD'S small volume on *Juvenile Delinquency*[5] will be found of practical value, because it contains an actual record of work accomplished and difficulties overcome. One of the great difficulties in coping with what is a very large social problem is to know the kind of organization necessary to deal with it at all adequately. The author shows that an attempt has been made by the legislature of the State of Ohio to deal seriously with the problem: a bureau of juvenile research has been established to treat cases appearing in the juvenile courts on scientific lines. The necessity for some such organization can be gauged from the fact that Dr. Goddard estimates that eventually the bureau, of which he is the director, will be called upon to handle 4,000 cases a year—cases of serious delinquency the causes of which must be discovered in order to prescribe treatment.

[3] *Anaesthetics in Practice and Theory.* A Textbook for Practitioners and Students. By J. Blomfield, O.B.E., M.D.Cantab. London: William Heinemann (Medical Books), Ltd. 1922. (Roy. 8vo, pp. xii + 424; 48 figures. 25s. net.)

[4] *Thérapeutique Post-Opératoire à l'usage des chirurgiens, practiciens et infirmières.* By E. Rochard and W. M. Stern. Paris: G. Doin. 1923. (Demy 8vo, pp. 725; 156 figures. Fr. 30.)

[5] *Juvenile Delinquency.* By Henry Herbert Goddard, Director, Ohio Bureau of Juvenile Research. London: Kegan Paul, Trench, Trübner, and Co., Ltd. 1922. (Cr. 8vo, pp. 120. 3s. 6d. net.)

Broadly speaking, the author finds the juvenile delinquent either feeble-minded or what he characterizes as "psychopathic." His views as to the second group are not particularly encouraging or hopeful. He appears to regard the cases included in it as suffering from actual mental disease; and, somewhat unconvincingly, attributes this in a large proportion of cases to the influence of congenital syphilis. The term "psychopathic child" is not satisfactory; we should imagine that it must include a number of benign cases, due to unfavourable environment, neglect, and psychogenetic factors, in which a psychotherapeutic approach would be very beneficial.

NOTES ON BOOKS.

THE thirty-ninth annual *Year Book of the Scientific and Learned Societies of Great Britain and Ireland*[6] is a well arranged volume which records the work done in science, literature, and art during the past year. The information which it gives cannot easily be found elsewhere, and the increasing size and scope of the volume make it each year more useful as a work of reference. Such a volume depends greatly upon the co-operation that exists between the officials of the numerous scientific and literary societies and the publishers, and both are, on the whole, to be congratulated on the results. The contents are grouped under sections, which include science generally—that is to say, those societies occupying themselves with several different branches of science, or with science and literature jointly: astronomy, mathematics, and physics; chemistry and photography; geography, geology, and mineralogy; biology; economic science and statistics; mechanical science and architecture; agriculture and horticulture; literature, history, and music; medicine; archaeology; and some others. Twenty-four pages seem hardly an adequate share for medicine in a scientific reference volume of 374 pages, but the fault may be rather with the secretaries of medical societies than with the editors of the *Year Book*. The personnel of the Ministry of Health is detailed, and the names are given of the principal officers of the British Medical Association, with the titles of the papers read at the different Sections of the Annual Meeting. The titles of all the papers read at the Royal Society of Medicine are included, and also the titles of the publications issued by the Medical Research Council and of the scientific papers published from the Lister Institute, together with similar details of many medical societies throughout the country.

The application to psychology in recent times of what in comparison with the older procedure by way of introspection may be called the observational and experimental methods has had the effect of greatly increasing public interest, and it is a sign of the times that a publication written so completely from the popular standpoint as the *Daily Mail Year Book* (1923) should contain an article on applied psychology. Within the limited space at his disposal Mr. W. N. Shansfield has succeeded in giving the casual reader a very good idea of what is being done with regard especially to applications of science to the estimation of industrial capacity, and of the intelligence and aptitude of children; in this connexion he relates the origin of the Binet-Simon tests, designed mainly to detect the cause of backwardness in any particular case. Dr. Kimmins, speaking from his experience in London schools in an address given during the annual conference of the Education Association last week, praised the Dalton plan for discovering the unusually endowed or unusually quickly learning child and giving scope to this ability or quickness, while not forgetting that the tortoise may win the race.

Professor HALLIBURTON'S book, *The Essentials of Chemical Physiology* for the use of students,[7] was first published in 1893. New editions have been called for every three or four years, and we have now received a copy of the eleventh. It does not differ materially from the tenth, but new exercises have been introduced dealing with the detection of enzymes, the estimation of oxygen in the blood, and on gastric acid. Opportunity has been taken to rewrite the section on coagulation of blood; in concluding this section the author admits that he finds it difficult to be dogmatic and has been content to give an outline of what to his mind is the probable explanation of the remarkable phenomenon of coagulation. The exact part played by the platelets has still to be ascertained, but he thinks it not improbable that their function, if any, will be found in their effect upon surface action.

[6] *The Year Book of the Scientific and Learned Societies of Great Britain and Ireland.* Thirty-ninth issue. London: C. Griffin and Co., Ltd. 1922. (Demy 8vo, pp. vi + 374. 15s.)

[7] *The Essentials of Chemical Physiology.* For the Use of Students. By W. D. Halliburton, M.D., LL.D., F.R.S. Eleventh edition. London and New York: Longmans, Green, and Co. 1922. (Demy 8vo, pp. xi + 343; 71 figures, 1 plate. 8s. 6d. net.)

DANGEROUS DRUGS ACT, 1920.

THE POSITION OF DOCTORS AND DENTISTS.

THE following memorandum, dated January 9th, has been issued by the Home Office, and will subsequently be published in pamphlet form by the Stationery Office:

HOME OFFICE MEMORANDUM.

1. By the Dangerous Drugs Act and the Regulations made under it certain obligations in regard to the giving of prescriptions, keeping of records, etc., devolve on medical and dental practitioners and the Home Secretary, with whose Department rests the general responsibility for the administration of the Act and Regulations, has had under consideration the best means of carrying out such inspection as may be necessary from time to time to ensure the due fulfilment of those obligations. He has come to the conclusion that such inspection would be best carried out by medical officers, and after consultation with the Minister of Health and the Scottish Board of Health, it has been arranged that as a general rule this work shall be carried out in England and Wales by medical officers of the Ministry of Health, and in Scotland by medical officers of the Scottish Board of Health.

2. It is considered that it may be convenient for doctors and dentists to have a short statement of the main provisions of the Act and Regulations in which they are specially concerned.

I. GENERAL PROVISIONS.

Substances Involved.

3. The substances to which the Dangerous Drugs Act applies are:

Raw opium; and

Collectively referred to as Dangerous Drugs:—
- Medicinal opium;
- Cocaine and ecgonine and their salts;
- Morphine and its salts;
- Diamorphine (heroin) and its salts; and any preparation, admixture, extract or other substance containing one-fifth per cent. or more of morphine or one-tenth per cent. or more of cocaine, ecgonine, or diamorphine.

The percentage in the case of morphine is calculated as in respect of anhydrous morphine.

4. No person is allowed to bring into, or take out of the country any of the drugs unless he is licensed by the Home Secretary, and no person is allowed to be in possession of the drugs (subject to the exceptions named in the next paragraph) unless he is licensed or otherwise authorized for the purpose, or unless the drug has been supplied for his use by a medical practitioner or in accordance with a medical or dental prescription.

Preparations Excepted.

5. It should be noted that the following preparations, though they come within the Act, are specially exempted from the Regulations and may be bought and sold in this country in the same way as ordinary "poisons" under the Poisons and Pharmacy Act:

Cereoli iodoformi et morphinae, B.P.C.
Emp. opii, B.P. 1898.
Lin. opii, B.P.
Lin. opii ammon., B.P.C.
Pasta arsenicalis, B.P.C.
Pil. hydrarg. c. opio, B.P.C.
Pil. ipec. c. scilla, B.P.
Pil. plumbi c. opio, B.P.
Pil. digit. et opii co., B.P.C.
Pil. hydrarg. c. creta et opii, B.P.C.
Pulv. cretae aromat. c. opio, B.P.
Pulv. ipecac. co., B.P. (Dover's powder).
Pulv. kino. co., B.P.
Suppos. plumbi co., B.P.
Tablettae plumbi c. opio, B.P.C.
Ung. gallae c. opio, B.P.
Ung. gallae co., B.P.C.

It should also be noted that the following preparations do not come within the Dangerous Drugs Act:

Any preparation containing less than one-fifth per cent. of morphine or one-tenth per cent. of cocaine, ecgonine, or heroin. Thus any mixture containing in each drachm not more than 11 minims of tr. opii or 13 minims of liquor morphinae hydrochlor. and 15 minims of liquor morphinae acetat. would be unaffected by any of the provisions of the Regulations.

Medical Practitioners and Dentists are authorized Persons.

6. Any duly qualified medical practitioner and any registered dentist is authorized by the Regulations to be in possession of and to supply dangerous drugs and (in the case of medical practitioners only) raw opium, *so far as is necessary for the practice of his profession.* The words [in italics] are important: a doctor or dentist may not have or use the drugs for any other purpose than that of ministering to the strictly medical, or dental, needs of his patients.

7. Subsequently throughout this Memorandum "doctor" is to be read as meaning a medical practitioner whose name is on the *Medical Register;* and "dentist" as a dental practitioner whose name is on the *Dental Register.*

8. In what follows it should be noted that Part II applies to all practising doctors and dentists, Part III to those only that dispense.

II. Regulations Applicable to all Doctors.

Prescriptions.

9. The following remarks only apply to prescriptions for medicines containing a dangerous drug in sufficient strength to come within the Act (see above).

10. The Home Secretary has power to prescribe an official form to be used for such prescriptions, but he has not at present done so.

11. Under the Regulations the prescription—

(*a*) must be in writing and be dated;

(*b*) must be signed with the *full name* of the prescribing doctor or dentist (the Christian names, as well as the surname, must be written in full; initials do not satisfy the Regulations*);

(*c*) must bear the *address* of the prescribing doctor or dentist (except in the case of prescriptions issued for National Health Insurance purposes on the official form);

(*d*) must state the name and address of the patient (a prescription may not be given for the use of the prescriber himself);

(*e*) must state the total amount of the drug to be supplied on the prescription.

12. Dentists may give prescriptions for dental treatment only, and in addition to complying with the above requirements they must mark the prescription "for local dental treatment only."

13. The prescription has to be retained by the chemist by whom it is dispensed (except in the case of prescriptions issued for National Health Insurance purposes on the official form), and he is only allowed to dispense it once, unless the doctor or dentist specially directs in the prescription that it may be dispensed twice or three times (but not more than three times) at intervals which he specifies. In no case is the chemist allowed to dispense it more than three times.

14. A doctor or dentist who gives, and a chemist who accepts and dispenses, a prescription not drawn up in every particular in accordance with these Regulations commits an offence against the Act.

15. The Home Secretary desires to impress as strongly as possible on doctors and dentists the importance of their observing these requirements strictly when giving a prescription. Any irregularity on the part of the doctor or dentist may lead to delay in the patient obtaining the medicine prescribed for him, and it is extremely unfair to the chemist that he should be placed in the position of delaying an important prescription, and possibly offending the doctor or dentist, or committing a breach of the law. The Secretary of State has reason to believe that at the present time there are very numerous irregularities in giving prescriptions for the drugs, and representations have been made to him by chemists as to the difficult position in which they are placed, and, he is afraid he must add, the annoyance or resentment displayed by doctors and dentists in many cases at being asked to correct the irregularities of their prescriptions.

Method of Obtaining Supplies of the Drugs.

16. A doctor or dentist who requires the drugs for the purpose of his practice may obtain them from any person who has a general licence or authority under the Dangerous Drugs Act to supply the drugs. All pharmacists who are lawfully keeping open shop in accordance with the provisions of the Pharmacy Acts are so authorized (except in the rare cases where the authorization has had to be withdrawn for offences against the Regulations), and all or practically all the established firms of wholesale chemists have also obtained licences from the Home Secretary to supply the drugs. In any case of doubt a doctor or dentist can always ascertain, by inquiry from the Home Office, whether a firm is authorized to supply the drugs or not.

17. It will assist the administration of the law, and probably also save the doctor or dentist some inconvenience, if he gives all orders for the drugs in writing (except in cases of extreme emergency), and signs them with his full name and address. The chemist has to satisfy himself before selling the drugs that the purchaser is authorized by the Regulations to have them, and in cases where the doctor or dentist is not well known to him some delay in making inquiries may be avoided by a full written order, duly signed.

18. If a messenger is sent by the doctor or dentist to take delivery of the drugs, the messenger must be given an authority in writing, signed by the doctor or dentist, to receive the drugs on behalf of the doctor or dentist; a chemist is forbidden to deliver drugs to a messenger not so authorized.

19. A doctor or dentist is not allowed to be supplied with the drugs on a prescription made out by himself in his own favour.

20. Doctors and dentists are advised to keep any dangerous drugs, when not in use, under lock and key so far as possible. This is not actually required by the Regulations, but is obviously a desirable precaution.

21. A doctor or dentist who requires the drugs solely for administration to his patients by himself personally, or under his own direct personal supervision, and does not dispense them, is under no obligation to keep the records required by the Regulations as explained in Part III of this Memorandum.

* It is proposed in the case of prescriptions issued for National Health Insurance purposes on the official form to require only the surname in full, with the initials of the Christian names.

III. Regulations Applicable to Dispensing Doctors.

22. Doctors who dispense or supply medicine* are under the obligation to keep the registers of purchases and supplies described below.

Register of Purchases.

23. Separate registers or separate parts of a register are to be appropriated for each of the drugs. The form in which the register has to be kept is as follows:

Date on which supply received.	Name of person, body, or firm from whom obtained.	Address of person, body, or firm from whom obtained.	Amount obtained.	Form in which obtained.

24. The correct entry in the register must be made on the day on which the drug is received or the following day; an entry must not be cancelled, obliterated, or altered—any mistake must be corrected by a footnote or marginal note giving the correct particulars, and dated.

Register of Supplies.

25. Similar registers or parts of a register must be kept for each drug "supplied" in the following form:

Date of supply.	Name of person to whom supplied.	Address of person to whom supplied.	Authority of person, body, or firm to be in possession of the drug.*	Amount supplied.	Form in which supplied.	Specify the ingredients of the prescription.

* Where, as will usually be the case, the supply is on the doctor's own prescription, it will be sufficient to enter the word "Patient" in this column.

26. The entry must be made on the day on which the drug is supplied or the following day. The same rules as to mistakes and corrections apply.

27. *N.B.*—It is specially provided, however, by the Regulations, that if a doctor keeps a day-book in which he records particulars of any of the drugs dispensed by him to his patients, with the name and address of the patient and date of supply, he need only record in his register of supplies the date and the appropriate reference to the entry in his day-book.

28. A doctor who dispenses at more than one set of premises is required to keep a separate register or registers at each set of premises.

29. All records, including registers, day-books, and other documents, must be kept for not less than two years from the date of the document or the last entry therein.

IV. Offences and Penalties.

30. A doctor or dentist who obtains, or attempts to obtain, the drugs for a purpose not covered by his authorization, or who infringes any of the Regulations, commits an offence against the Act, and if convicted is liable to a fine of £200 or to imprisonment with or without hard labour for six months, or to both fine and imprisonment.

31. Further, the Home Secretary has power, after the conviction of any doctor or dentist, to withdraw from him his authorization; the effect of this would be to deprive him entirely of the right to be in possession of or to supply the drugs.

V. Hospitals, etc.

32. Hospitals, asylums, Poor Law institutions, or sanatoriums supported by a public authority or out of public funds, or by a charity or voluntary subscriptions, have been exempted by Home Office Order from the operation of the Dangerous Drugs Regulations subject to compliance with the conditions laid down in the Order. The terms of the Order (dated August 15th, 1921, and to be obtained from the Stationery Office) should be consulted.

VI. Inspection.

33. All registers, and other records, required to be kept for the purposes of the Dangerous Drugs Act and Regulations thereunder, and any stocks of the drugs held, must at all times be available for inspection by any duly authorized inspector.

34. As indicated in the opening paragraph of this Memorandum, the Home Secretary has authorized Medical Officers of the Ministry of Health and of the Scottish Board of Health to act as Inspectors for this purpose in England and Wales and in Scotland respectively.

35. Notice of a visit for the purposes of inspection will not necessarily be given, and medical practitioners who dispense should make such arrangements that the registers and other records can be produced, if required, for inspection in their absence.

* The obligation would apply in the case of a doctor or dentist leaving a supply of any of the drugs with a nurse for administration to a patient during the absence of the doctor or dentist.

British Medical Journal.

SATURDAY, JANUARY 13TH, 1923.

"ANGELS AND MINISTERS."

SIR JOHN SIMON, in his famous essay on a Ministry of Health, after putting his finger on the more glaring defects and wrongs of the sanitary condition of the country in 1854, indicated the obvious remedy: "Surely no one will doubt [he said] that this great subject should be dealt with by comprehensive and scientific legislation; and I hardly see how otherwise, than that it should be submitted in its entirety to some single department of the executive, as a sole charge; that there should be some tangible head responsible — not only for the *enforcement* of existing laws, such as they are or may become, but likewise for their *progress* from time to time to the level of contemporary science, for their *completion* where fragmentary, for their *harmonization* where discordant."[1]

This was the ideal set before the General Board of Health by the great sanitarian who became its first medical officer. The establishment of that Board and the appointment of medical officers of health were largely due to the report of the Royal Commission appointed by Sir Robert Peel in 1843 at the instigation of Edwin Chadwick. Among those who gave evidence before the Royal Sanitary Commission of 1869 were Simon and Farr. "Speaking broadly," says Sir George Newman, "the 1843 Commission found the existence of a serious national evil of insanitation and ill health, and recommended a legislative remedy, whereas the 1869 Commission found that the remedy had proved ineffective, and recommended that 'the present fragmentary and confused sanitary legislation should be consolidated.' They proposed, in fact, for the first time, a Ministry of Health; but the case miscarried, and the Local Government Board was created in 1871."[2] But although the case did indeed miscarry, Simon throughout his long official career kept steadily before him the ideal expressed in his essay. He was convinced that there should be a Minister of Health sitting in Parliament, and that the duty of the central department of health should be, in the widest sense, to care for the physical interests of the people, just as their educational interests were the care of the Minister of Education: "the people, through its representatives, must be able to arraign him wherever human life is insufficiently cared for." Simon declared that the incongruities belonging to "our abortion of a sanitary system" must be ended, and he called for the appointment of a parliamentary leader (not necessarily himself a medical man) who could recognize principles and stick to them.

In 1868 the British Medical Association pressed upon the Government of that day the policy of instituting a Ministry of Health, and in subsequent years it again tried to obtain consideration of this national question, but without avail. Then, fifty years later, when the spirit of reconstruction was abroad, an opportunity came for furthering the cause. A feature of the closing stages of the great war was the movement of public opinion towards a demand for the extension and co-ordination of the health services of the country. In 1917 a Committee of the Association undertook the task of presenting to the Government and to the public the medical case for the establishment of a Ministry of Health, and a reasoned statement was issued in the following April. The purpose of the proposed reform was to make administration more efficient through a combination of departments and co-ordination of powers. The Association's scheme for the new Ministry included the recommendation that an Advisory Council, composed of representatives of all the interests concerned, including the medical profession, should be, by statute, an integral part of the Ministry. This idea was further developed by Lord Dawson in his Cavendish lectures published in our columns on July 13th, 1918. A Medical Advisory Council, he held, should form part of the permanent organization of the Ministry. It is interesting to recall here the words of Simon sixty-four years earlier: "Into the hands of this new Minister —advised, perhaps, for such purposes by some permanent commission of skilled persons — would devolve the guardianship of public health against combined commercial interests, or incompetent administration."

The times were ripe for this reform. After preliminary administrative changes had been made a Ministry of Health was set up by Act of Parliament, and on July 1st, 1919, all the powers and duties of the Local Government Board and of the Insurance Commissioners for England and Wales passed to the Ministry of Health. Simultaneously a Scottish Board of Health and an Irish Public Health Council were constituted. The creation of the new Ministry carried with it an undertaking for reform of the Poor Law—as yet, however, unfulfilled. At that moment the Premier had a choice of two Cabinet colleagues of great administrative experience for the new post—Dr. Christopher Addison and Sir Auckland Geddes. Both were doctors of medicine, though each, in fact, was an anatomist, not a practitioner. Dr. Addison became first Minister of Health, with a great public servant, the late Sir Robert Morant, as permanent head of the department, and the first Medical Consultative Council was appointed by the Minister three months later, with Lord Dawson as Chairman. The new central department of health had much to contend against in its earlier months. The task set before it was tremendous. It was called upon to meet the demands of the medical profession and the public for better health conditions; at the same time it was ordered to find and apply an instant solution of the urgent housing problem. Within a year Dr. Addison had become an object of political enmity, and this campaign went on until April, 1921, when, being in disagreement with the Premier over the Government's housing policy, he resigned office to a layman. On the fall of Mr. Lloyd George's Government Sir Alfred Mond was succeeded by Sir Arthur Griffith-Boscawen, another layman, who at the moment is in the ambiguous position of being a Minister but not a member of either House.

This brief outline of events and opinions will perhaps be useful to the general medical reader as an introduction to Sir Lenthal Cheatle's spirited article in the current issue of the *Nineteenth Century*. The essay is aptly entitled, "Ministers of Health—Defend Us!" Here we have in uncompromising terms the case against any layman ever holding the post of Minister of Health. In the interest of public health, says Sir Lenthal Cheatle, this office must be held only by a medical man of recognized position in his profession, just as the Lord Chancellorship can be held only by a man of recognized position in the legal profession. The public and the medical profession, he declares, should not tolerate for a moment a Ministry directly concerned with public health being in the hands of a politician, however brilliant, who is not a doctor having special qualifications for the post. In making this point over and over again the author probably has in mind the saying, attributed to Delane, that repetition is the soul of journalism. He is aware of certain objections

[1] *Public Health Reports.* By John Simon, C.B., F.R.S. Edited by Edward Seaton, M.D. London. 1887. Vol. i.
[2] *An Outline of the Practice of Preventive Medicine.* 1919.

to the principle he advocates, but they do not dismay him. Thus the argument founded on the allegation that Dr. Addison was not a success is answered, and we think quite fairly, by saying that a Minister of Health should not have foisted upon him the conduct of political affairs that have no concern with public health, and in any case his failure in such matters should not be visited upon him as Minister of Health. "I can quite see that the Minister of Health should advise the Government to build more houses, and that he should be consulted as to whether the houses provided are sanitary and fit to live in; other than that function, I cannot see how the policy involved can possibly be a question for a Minister of Health. It is a great Government problem." Another objection—that several great departments of State are not represented by professional men in Parliament—is noted, but reserved for future argument.

Without going all the way with Sir Lenthal Cheatle, we may say that his point of view, expressed with much cheerful vigour, has a great deal to commend it. The ideal Minister of Health would obviously be a medical man having the exceptional attainments here sketched. But entry into the House of Commons turns so largely upon the play of party politics, and the changes and chances of political life are so great, that when a Government has to be formed a medical statesman of the first magnitude may not be at hand. Such a man may be amongst us to-day; yet when he went out of office it might be said with truth: "Here was a Caesar! When comes such another?"

A CENTURY OF PASTEUR.

PASTEUR was born at Dôle, in the Jura, on December 27th, 1822; he died on September 28th, 1895, at Villeneuve-l'Etang, where the French Government had assigned him a small estate for the study of rabies. His life of original research began in 1844, and into the next forty-five years was crowded so much that his pupil and successor Roux can truly exclaim, "When we study the work of Pasteur we marvel that one man could do so many things and such great things!"[1]

Pasteur began with crystallography, and was one of the founders of stereo-chemistry; he went on to fermentation and founded the chemistry of the fermentation industries, now a big department of applied chemistry; and finally gave himself to the study of the cause of infectious diseases, and so founded the science of bacteriology, and laid down the main lines on which the study of attenuation and immunity has since proceeded. He had industry, patience, and courage, as well as genius; he had many fellow workers, not a few critics and opponents; these he met with the facts of experiment, brilliantly devised and logically interpreted, but for the most part he went his own way, gathering about him a great company of disciples, so that the *opus Pastorianum* did not end with his life.

It is interesting to note how Pasteur was drawn on from one set of investigations to the next. He was trained as a chemist, and for the first ten or twelve years of his working life was a lecturer on chemistry. His first great achievement was in physical chemistry.[2] Tartaric acid had been known since 1796. A substance which it was soon seen resembled it was found in grape-juice vats in Thann, in Alsace. To it the name racemic acid was given, and before long it was shown that it had the same empirical composition as tartaric acid. Biot, who was then at work on polarization, discovered that while tartaric acid, its salts and their solutions, turned the plane of polarization of light to the right, racemic acid, and its salts and their solutions, did not produce any effect. Pasteur proved that the racemic salt consisted of two varieties of crystals, the one turning the plane of polarization to the right (dextro-rotatory tartaric acid), the other to the left (laevo-rotatory tartaric acid). The crystal of the one was the mirror image of the crystal of the other. He also showed that the two tartaric acids went into molecular combination, taking up a molecule of water to form racemic acid. In the product the two varieties of tartaric acid, active optically in opposite directions, produce optical inactivity. Here Pasteur was working at the foundations of stereo-chemistry, which in our days has gone on to the elucidation of the structure of the atom and of the molecule, as well as of the crystal. Pasteur in after life often expressed his regret that he had not stuck to crystallography; but the subject in all its bearings, it is now seen, could only be elucidated with the help of radium and the x rays. During the course of his investigations of racemic acid and its salts Pasteur made the surprising observation that when the green mould, *Penicillium glaucum*, was grown in a solution of racemic acid it attacked only the dextro-rotatory tartaric acid, leaving the laevo-rotatory variety untouched so long as any of the dextro variety remained. Thus did Pasteur get his first insight into the chemistry of life and the activities of the infinitely little. In 1854 Pasteur was appointed dean of the newly established Faculty of Science at Lille and a professor in that faculty. The town was the centre of the industry which makes alcohol from beetroot. He made the observation that the amylic alcohol produced during the process of fermentation consisted of two isomers, the one deflecting the plane of polarization and the other inactive; and the idea occurred to him that there might be some relation between the ferment and the molecular constitution of the bodies produced by the fermentation. He was diverted from these speculations by an appeal—to which all through his life he was always ready to respond—to come to the rescue of the industry. The request was made by a distiller, M. Bigo, who complained that the fermentation in some of his vats went wrong. Pasteur went to the distillery; in the healthy vats he found only the yeast, but in the sick vats he detected also small rods, which he proved to be living things.

His next observations were on lactic fermentation.[3] He had been transferred to an administrative post at the Ecole Normale, in Paris, and his experiments were made in an attic fitted up as a laboratory by himself, where he had no helper except his wife. He showed that the transformation of sugar into lactic acid was due to an organism hitherto undescribed, and he put out the idea that every fermentation was due to a ferment special to it, and that the ferment was a living microscopic thing. This was in 1857; in the following year he began to investigate the fermentation of sugar, which produces alcohol, and, besides that, as was then supposed, carbonic acid only. He found that in the process of fermentation small quantities of glycerin and succinic acid were produced, representing together about 5 per cent. of the sugar employed. He maintained that the fermentation was due to the life and growth of a living ferment—a commonplace to-day, but a view which at that time brought him into conflict with the general belief among chemists, which was that fermentation was set up by the disintegration of dying nitrogenous substances. He showed that, on the contrary, it ran parallel with the growth of the living ferment, and was in fact due to the activity of the living thing. At this stage he was brought

[1] *Rev. des Deux Mondes*, December 15th, 1922.
[2] *Oeuvres de Pasteur*. Tome I. *Dissymétrie moléculaire*. Paris: Masson et Cie. (Fr.50.)
[3] *Oeuvres de Pasteur*. Tome II. *Fermentations et générations dites spontanées*. (Fr.65.)

into conflict also with those who defended the doctrine of spontaneous generation. We will not attempt to relate the prolonged controversy which ensued, but will only note that the arguments of his opponents stimulated Pasteur and his fellow workers, Roux and Chamberland, to perfect their methods of sterilization.

From lactic fermentation he passed to butyric, in which sugar and lactic acid are transformed into butyric acid, and made the unexpected discovery that the butyric fermentation was due to a micro-organism which could not live in contact with air. Very soon he established the existence of other anaerobic organisms, and reached the generalization that they were the true organisms of putrefaction, those which first attacked dead nitrogenous matter reducing it to simpler forms, which were then attacked by aerobic organisms which transformed them into still simpler bodies. Next he turned to the acetic fermentation; he was induced to do so by difficulties encountered in the manufacture of vinegar similar to those that had occurred in the manufacture of beetroot alcohol at Lille. French vinegar is made in butts half filled with wine and inoculated with the *Mycoderma aceti*, which grows on the surface as a sort of scum; failures in manufacture he showed were due to contamination of the wine with other microbes. This observation brought him into conflict with Liebig, who maintained that the organism was not present during the manufacture of vinegar in the German manner, from alcohol and sour beer. Everyone knows now that Pasteur was right. Next he was called upon to apply to wine the principles he had established with regard to the cause of failure in the manufacture of beetroot alcohol and of vinegar. He accepted an invitation from the town of Arbois, not far from his birthplace, to study the diseases of wine—acidity, bitterness, ropiness, and so on. By microscopic examination he proved that all were due to microbic contaminations, and that these germs could be destroyed by warming the wine out of contact with air to a temperature of 55°C., a process which did not interfere with subsequent maturation.

From wine, in 1870, he went on to beer, and by the application of the same principles rendered a similar service to that industry. Meanwhile he made his first contact with disease. In 1865 one of his old teachers, J. B. Dumas, appealed to his patriotism to investigate the disease of silkworms, which was ruining the silk industry. Rather against his will he accepted the invitation, mainly because he desired to help the unfortunate peasants whose livelihood was being destroyed. The disease was found to be associated with the presence of certain corpuscles which could be seen in the infected worms. These corpuscles were transmitted from the imago to the eggs. The inquiry was complicated by the fact that silkworms also suffer from another disease due to a sporing vibrio, but Pasteur showed how both diseases could be prevented, and his methods are now taught in special schools of sericulture. It was at this period of his life (1868) that Pasteur was struck down by left hemiplegia, but he recovered quickly, regaining all his mental and nearly all his physical activity.

Pasteur was disinclined to embark on the study of human diseases, but he consented, at the request of a pupil, to investigate the cause of puerperal fever. He came to the conclusion that it was due to a chain microbe (streptococcus), and that it was carried from the infected woman to a healthy woman by the doctor and the midwife. Consequently he recommended the sterilization of all linen and dressings. He had been watching also the work of Lister, and the great things it was achieving for surgery encouraged him to give his attention more and more to disease in animals and man. At the request of the French Director of Agriculture he began to investigate anthrax, but first made some experiments on the disease called fowl cholera. It was during his study of the last-named disease that he discovered the possibility of attenuating the virulence of a virus. In this instance it was achieved by keeping the cultivation of the microbe at a temperature of 37° C., when it was observed gradually to lose its virulence. Birds inoculated with material taken from the cultures at a suitable period were protected from subsequent inoculation with a virulent virus. To this method of protection Pasteur applied the term "vaccination," in honour of Edward Jenner, who had, by another way it is true, formulated a method for protecting man against small-pox—a method Pasteur himself adopted when providing a means of vaccination against swine erysipelas. He turned next to rabies; the nature of the virus was then and is still unknown; but he recognized that the disease was mainly localized in the brain and spinal cord, and by drying the cords of rabbits at various periods obtained material for therapeutic inoculation. As Professor Ledingham has well said, "To Pasteur the accurate knowledge of a virus was simply a stimulus to attack the disease on the preventive side, but neither to him nor to his great contemporary Lister was this stimulus an essential one. If a virus could be demonstrated and cultivated outside the body, so much the better. Attenuation was all the simpler. So when he came to rabies, ignorance of the actual virus did not deter him from the attempt to attenuate its virulence."[4]

There was in Pasteur something of the faith of the great religious propagandists. His religion was the love of humanity, and his observance was to win for man control over the forces of Nature; he would have agreed that "ignorance is the curse of God, knowledge the wing wherewith we fly to Heaven."

THE JENNER CENTENARY.

THE centenary of the death of Edward Jenner, the discoverer of vaccination, will be celebrated by the Royal Society of Medicine at a meeting on the anniversary day, Friday, January 26th. The President of the Society, Sir William Hale-White, will give an address on Jenner and his work, and a collection of relics and exhibits will be lent for the evening by the Wellcome Historical Medical Museum. The Curator of the Museum is arranging in it a commemorative exhibition of personal relics, pictures, engravings, drawings, documents, and caricatures, which will remain open for some months, and will be on view from 10 to 5 daily. The Curator asks us to say that he will be glad to hear from any persons possessing objects of interest in connexion with Jenner and his work which they would be willing to lend; loans while on exhibition will be insured, and any expense incurred in transit will be paid by the Museum. Communications should be addressed to Mr. C. J. S. Thompson, M.B.E., Curator, the Wellcome Historical Medical Museum, 54A, Wigmore Street, London, W.1. As already announced, the Académie de Médecine intends to celebrate the centenary on January 23rd; the Académie has invited the Royal Society of Medicine to send representatives, and is ready also to welcome any Fellows of the Society who may be able to go to Paris.

THE HOUSING OF AN X-RAY DEPARTMENT.

THE new *x*-ray department of the Manchester Royal Infirmary, some description of which appeared in the JOURNAL of November 25th, 1922 (p. 1044), was the principal subject of a lecture given by Dr. A. E. Barclay before the Röntgen Society on January 2nd. The planning of an *x*-ray department is usually a matter of compromise and to some extent of makeshift, but at Manchester this factor of compromise had required less consideration than usual, except in so far

[4] Pasteur Supplement to *Nature*, December 23rd, 1922.

that the department had to be accommodated within the walls of an existing building of mediaeval solidity and modern ferro-concrete construction, originally designed as common rooms for students. One interesting feature was the method adopted for protecting the partition walls between the various rooms. It had been intended to protect them with sheet lead, but the suggestion was made that commercial barium sulphate could be used with cement, and after a number of experiments a successful mixture was found. When tested with radium a thickness of three-quarters of an inch (19 mm.) of this plaster proved to be equivalent to between 3.5 and 4.5 mm. of lead. The walls of the treatment cubicles were plastered on both sides, the total thickness of plaster being one and a half inches. The ease of application and the smallness of cost of the barium plaster should make this the protective method of choice. The cost of lead at the time the department made its purchases was £22 a ton, while commercial barium sulphate was obtained at £10 a ton. In discussing the general question of housing an *x*-ray department, Dr. Barclay said that in the average country hospital, if one looked for the darkest, steepest, and most awkward stairway leading below ground, one generally found that it led to the *x*-ray room. In one English town a hospital of 60 or 80 beds had enlarged itself by absorbing the adjoining police station. The police had sold the place because the cells were too damp for the well-being of their lodgers, and it was in two of these cells that the *x*-ray and dark rooms were accommodated. An *x*-ray department in a cottage hospital was expected to tackle anything and everything; hence the outfit in the small hospital had to perform many functions, though, the number of cases being small, there was usually plenty of time for the necessary rearrangement. In a general hospital of 150 beds both radiographic work and *x*-ray treatment would be in progress for the greater part of the day, with the result that separate rooms would be necessary for these two branches. In a still larger hospital there would be further subdivisions, such as a special room for screening work. In a hospital associated with a medical school a new set of conditions presented themselves; here the large volume of routine work of a general hospital had to be done, and in addition much special work along the lines of teaching, investigating, and recording. Dr. Barclay's plan for a large hospital with a teaching school included the provision of rooms both for ordinary and for intensive *x*-ray treatment, an ordinary radiographic room and a special room for screening, a fluoroscopic room for serial plates and the like, and a suite of rooms for the medical officers and nurses, and for office, storage, and workshop purposes. The staff should include two senior and two junior medical officers, a physicist, three assistants for *x*-ray treatment, a radiographer, a photographer to develop negatives, a photographic librarian, a mechanic, a clerk, two nurses, and a sister. The largest department differed from the small department in the cottage hospital only in the respect that the numbers dealt with made it necessary to multiply the units, and as the units were multiplied it was reasonable to adapt certain of them to certain special types of work. In small hospitals radiology was a problem which even apart from the cost was not easy to solve owing to the difficulty of obtaining the services of a radiologist; they could not afford to pay a radiological specialist adequately for the time that was necessary, and from his colleagues on the staff such a specialist was not likely to get sufficient private work to make the post worth his while. The only solution appeared to be the provision of central *x*-ray clinics, maintained by a number of small hospitals, each of which would contribute according to the amount of work it required to be done. In each small hospital there would be, in addition, a simple plant for dealing with fractures and light work, which would be operated by one of the assistants, who would bring the plates back to the centre for development and report. The central clinic would also be available for *x*-ray work under national insurance when that scheme came to provide specialist services. Doubtless such clinics would pay their way and afford adequate salaries for radiologists, but they would be abused by people who could afford to pay full fees and would be harmful to the interests of the radiologist who depended on private practice.

VITAMINS AND REPRODUCTION.

THE existence of the three vitamins A, B, and C has been generally accepted, but several workers have brought forward evidence for the existence of other vitamins. For example, it has been suggested that the antirachitic substance present in cod-liver oil is not identical with the fat soluble vitamin A. It is not improbable that there are a large number of organic substances, small supplies of which are essential to animal life, and hence it is not possible to set a limit to the number of these substances. The existence of a new vitamin essential for reproduction is suggested by H. M. Evans and K. S. Bishop of the University of California.[1] The authors fed rats on a diet containing a limited amount of vitamin A, plenty of vitamin B, and no vitamin C; on this diet the rats grew and developed normally but did not reproduce. The addition of lettuce leaves or even of dried alfalfa grass to the diet was followed by sudden restoration of fertility; the same effect was produced by an excess of butter, but not by cod-liver oil nor by orange juice. It is difficult to express an opinion on this work. It has long been known that animals on a diet slightly deficient in vitamin A will grow but will not reproduce. It is extremely difficult to be certain that the variations in reproduction observed were due to the action of a vitamin hitherto unknown and not to variations in the quantity of vitamin A in the diet. That this may be the explanation is made the more likely by the fact that the authors used butter and milk fat as the source of their vitamin A, and tenfold variations of vitamin A content have been observed in different samples of milk and butter. The number of possible experimental errors in work upon vitamins is extremely large, and hence it is permissible to reserve judgement as to the value of the conclusions reached by Drs. Evans and Bishop until we have an opportunity of studying their experimental methods in more detail. If the existence of a specific substance stimulating reproduction is established the observation may be important for the treatment of sterility both in the human race and in stock.

THE RETREAT, YORK.

THE 125th annual report of the Retreat, York, for the year 1921, records the retirement of Dr. Bedford Pierce, who had been its chief medical superintendent for nearly thirty years. The Committee of Management expresses its appreciation of the work done by Dr. Pierce during his long term of office, and records that under his management the great traditions of the Retreat have been more than maintained, and its sphere of usefulness extended. Dr. Pierce alludes to some of the changes which have taken place, and describes more particularly the efforts which have been made to develop the profession of mental nursing. Apart from the ordinary courses of instruction given in the hospital Dr. Pierce has arranged an annual lecture for the nursing staff. These lectures have been delivered by well known psychiatrists, and if it were possible to publish them in book form they would no doubt be found of value to mental nurses as a whole, and would usefully supplement the systematic knowledge contained in the nursing manuals. The report contains some interesting comments on the practical difficulties met with in dealing with voluntary boarders in mental hospitals. The question of certification which sometimes arises in these cases is recognized to be one of considerable difficulty. As Dr. Pierce points out, it is obviously not straightforward to receive a patient on the understanding that he may leave when he wishes, and then directly he asks to go to make arrangements for his detention as a certified patient. At the same time, though the practice of certifying voluntary boarders whilst in residence

[1] On the Existence of a Hitherto Unrecognized Dietary Factor Essential for Reproduction. *Science*, N.S., vol. lvi, No. 1458, December 8th, 1922, p. 651

may be undesirable, it cannot always be avoided. A change of phase in the psychosis may occur in which the voluntary status of the patient becomes impossible, and Dr. Pierce gives some striking instances in which certification became necessary in some of his voluntary boarders. There is no doubt that the addition of voluntary cases adds to the problems of the medical superintendent, and renders him liable to criticism even when he has acted in the best interests of his patients. Since, however, the system by which patients can be admitted on a voluntary basis to mental hospitals has much to commend it, every effort should be made to ensure that it is carried out in the right spirit. As Dr. Pierce observes, if either patients or boarders have any grounds for thinking that voluntary admission was intended to facilitate subsequent certification—in other words, that the authorities were insincere in accepting them—it would certainly cause grave injury to the prestige of the hospital. He suggests, also, that if any individual patient should feel aggrieved on this matter, even without justification, it is desirable that he should not remain, but be transferred elsewhere. Lastly, we may note that the committee has established a nursing home (Millfield), quite apart from and independent of the Retreat, for the care and treatment of mild and incipient cases of nervous disorder. Notwithstanding the financial difficulties it entails, the committee feels it right to continue this venture in response to the urgent public need for a home of the kind, free from any institutional connexion or association. This progressive move should meet with success: it represents on a small scale what it is hoped may be possible in the future in connexion with the public mental hospitals.

A SCOTTISH MEDICAL SOCIETY.

THE Aberdeen Medical Society was founded in 1789 by James McGrigor, afterwards known to fame as Sir James McGrigor, Bt., K.C.B., F.R.S., and for thirty-five years Director-General of the Medical Department of the Army. With him were associated James Robertson and a few medical students. In 1812 the society was reconstructed under the name of the Aberdeen Medico-Chirurgical Society, with William Livingstone, M.D., as president. Eight years later it entered into occupation of its permanent home, the hall in King Street, designed on classical lines by Archibald Simpson. Throughout the 133 years of its existence the society has had close relationships with the Aberdeen Royal Infirmary and with the Aberdeen Medical School. In its early days it did much to improve the medical teaching in the two rival foundations—King's College and Marischal College—which in later times amalgamated to form the University of Aberdeen of our own day. All this and much besides is told with pious care by Dr. John Scott Riddell in the *Records of the Aberdeen Medico-Chirurgical Society*.[1] Drafted at first in the form of a presidential address, the historian's work grew as he dug deeper into the records of the past, until its size got beyond the possibility of oral delivery at one session. The material was thereupon recast, many additions were made, and the whole was arranged for publication in book form. In this process the record of the work and influence of the Aberdeen Medico-Chirurgical Society came to embrace the medical history of Aberdeen since 1789. And so, as the author says in his peroration (chapter xii), "What was begun as a short address has expanded into a little book." A shortened version was, however, spoken to the members in the Society's Hall, by Dr. Scott Riddell, on October 26th, 1922, that being the statutory day for the delivery of the presidential address. At the conclusion of the address a copy of the book now before us was handed to each member. It is a pleasant volume to read and to handle; the printing is good, and the eleven illustrations, including several portraits and views of old King's College and Marischal College, are well reproduced on art paper.

[1] *The Records of the Aberdeen Medico-Chirurgical Society from 1789 to 1922.* With some Recollections, Recommendations, and Reflections. By John Scott Riddell, M.V.O., C.B.E., M.A., C.M., LL.D., President of the Society. Aberdeen: W. and W. Lindsay. 1922. (Demy 8vo, pp. xii+144; 11 illustrations. 3s. 6d. paper, 4s. 6d. cloth.)

HICCUP.

THOUGH it can be a grave complication in surgical shock and is then justly dreaded by surgeons, hiccup is usually a disorder which, though distressing to the sufferer, is regarded with a very moderate degree of sympathy by the onlookers. It may, however, go on for hours and days, and seriously interfere, not only with the comfort, but even the health of the subject. There are a multitude of remedies, some of them really partaking of the nature of folklore, but their action is capricious. Master John Arderne had evidently met with troublesome cases, for he has a note on remedies "against hiccough." He writes: "Let the leech tell the patient to hold his breath as long as possible. But if this does not stop the hiccough make him vomit, with radishes and mastiche. Let him drink warm water with a decoction of dill. Rue, too, drunk with wine is useful in such cases." A correspondent has sent us an extract from the Rev. W. B. Money's book, *Humours of a Parish and other Quaintnesses*, published a couple of years ago. Mr. Money's remedy presents some resemblance to Arderne's first prescription, and though the feat is not quite easy to perform it seems unlikely that it can have any injurious effect. "Take a tumbler and fill it about half-full of water, put your lips to the opposite side of the rim to what you ordinarily would in drinking, tilt the glass away from you instead of towards you, and so sip the water. That is all, but you will want nothing more; you will be a healed, a quiet, a restful man." Mr. Money declared that he had never known it fail, but relates the following instance as its greatest triumph: "I was fishing off the coast of Cornwall and my fisherman was fiercely attacked by hiccups, which he called 'the jicks.' They had lasted for two days. They were of the most terribly noisy character. They were almost like the 'minute gun at sea.' Poor fellow, they kept him awake at night. He really was in a most parlous condition, but he sniffed at my remedy and I couldn't induce him to try it till the end of the second day. When he did try it he was cured directly. The storm of hiccups was hushed, and now he is the most devoted believer in its powers." Mr. Money's prescription seems to be nothing but an ingenious device for inducing the patient to keep his lungs for a time in an average condition of distension, though he can still breathe. Ever since the classical experiments of Hering and Breuer we have known that on distension of the lungs afferent nerve ending of the vagus are excited and the corresponding impulses on reaching the respiratory centre inhibit inspiration. It seems, therefore, that these impulses inhibit also the violent inspiratory spasms of hiccup, and that the temporary relief thus produced lasts on for at any rate a very considerable time, so that the hiccup can by this means be controlled. Master Arderne's prescription of holding a deep breath for as long as possible seems to depend on the same principle.

MILK AND CREAM REGULATIONS.

IN 1912 Regulations were made under an Order of the Local Government Board the object of which was to prevent the use of preservatives in milk and to restrict their use in cream. Amending Regulations made in 1917 limited the amount of boric acid which could be added to cream to an amount not exceeding 0.4 per cent. of the cream, and required that on the labels attached to the vessels containing the cream there should be printed "Not suitable for infants or invalids," in addition to the words "Preserved cream." Early in January, 1921, the Minister of Health issued a memorandum with regard to the reports of public analysts under the Sale of Food and Drugs Acts, and the reports of medical officers of health on the Milk and Cream Regulations, and in a circular recently addressed by the Minister to town clerks and the clerks of county and borough councils a request is made that the reports for 1922 of these two officials should be on the lines of that memorandum. Information is asked for as to the results of proceedings taken with respect to samples examined and found not to be genuine, as to the extent to which preservatives are added

to food, and in the case of samples of milk as to the number of instances in which a sample of milk is reported on adversely and a further sample is taken direct from the cow for comparison. The medical officer of health is asked to supplement his report on the administration of the Milk and Cream Regulations with information as to the action taken under Section 4 of the Milk and Dairies (Amendment) Act, 1922. This is an important section, for it prohibits the addition to milk of any colouring matter or water or of any dried or condensed milk or any skimmed milk or separated milk. If the section is thoroughly and completely enforced an end ought to be put to the sophistication of milk which it is to be feared prevails in some districts.

THE JUBILEE OF THE ROYAL NORMAL COLLEGE FOR THE BLIND.

THE Royal Normal College for the Blind at Norwood is about to celebrate its jubilee, and its treasurer, Lord Burnham, is making an appeal for help to mark the event by establishing its finances upon a surer foundation; he asks for £75,000. There are few institutions for the training of the blind which are better known, and certainly there is no other that has done better work. The late Sir Francis J. Campbell, who was for many years the organizer and head of the college, had a genius for efficient management, and his ideas of what a college for the blind should be were far in advance of his time. Those ideas have been largely realized at Norwood both in his own time and subsequently under the control of his son, Mr. Guy M. Campbell. The work of the college is essentially practical, as will be apparent to anyone who pays a visit to the institution. The schools for the teaching of pianoforte repair and tuning are unique, and the efficiency of the training which is given to the blind who show musical capacity, either as performers or pianoforte tuners, is most excellent. The work is not limited to this branch, but extends to all that is required for an efficient higher training of the blind. The writer of this annotation visited the college recently and was greatly impressed with the excellence of the work in progress, and with the industry shown by both teachers and pupils. There was also a remarkable spirit of comradeship which is of inestimable value in replacing the shrinking timidity of the blind by a spirit of assurance and independence. The appeal of the college is one that should be supported by the generous-minded.

PHYSICAL TRAINING IN ELEMENTARY SCHOOLS.

IN 1917 the Board of Education offered grants in aid of the salaries of "organizers" of physical training in order to secure a high level of efficiency amongst the school teachers who were themselves to carry out the necessary physical exercises of the children. The organizers were not to teach the children, but to instruct and stimulate the teachers in this work, which was to be regarded as part of the regular curriculum. In a new circular (No. 1291) issued recently the Board states that experience has shown that the school teachers are competent to undertake this work, and that they can derive great benefit from the advice and demonstrations which the organizers are able to give. Certain education authorities have arranged for the organizer to engage in the actual teaching of the children, but this the Board finds unsatisfactory; the organizer becomes an expensive supernumerary, and the work which should be integral with the school work becomes a side issue in which the teachers are not directly interested. Other authorities have delegated certain teachers to do the work, with similar disadvantages. Yet other authorities have appointed persons to these duties without obtaining recognition for them as organizers. The Board states that it has no wish to close the door to reasonable experiments, which it will consider on their merits, but generally speaking it adheres to the practical advantages of its own scheme. The expenditure involved is small, and it is anticipated that the advantages to the children of the plan if properly developed will gradually afford relief from some of the heavy expenditure on other "special services." The advantages of the physical training as a means of preventing debility and promoting health, and also its general educational value in cultivating habits of discipline, self-control, and a sense of order and responsibility, need not be insisted on.

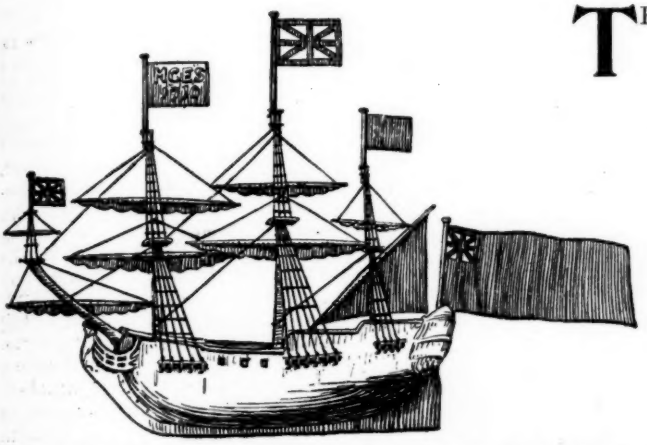
HOOKWORM DISEASE IN INDIA.

THE results of an investigation into the distribution and control of hookworm disease in India, prepared by the International Health Board of the Rockefeller Foundation, New York, have been published in the *Indian Journal of Medical Research* (October, 1922). The disease is present over almost the whole of the Indian Empire, but is more prevalent in Bengal, Assam, and Madras than in other districts. Of over 100,000 annual emigrants from Southern India arriving in Ceylon, the Malay States, and British Guiana, about 70 per cent., and among immigrants from India arriving in the United States from 63 to 90 per cent., were infested. In the Madras Presidency it is estimated that 70 per cent. of the population of 45 millions are infested, and many of these fall an easy prey to tuberculosis and other diseases. The infestation rate is high among English troops, and of the Indians of the Mesopotamia Expeditionary Force 24 per cent. were affected. Although in 1888 the prevalence of the disease was known and it was recognized that the consequences might be serious little was done until 1903; since then its importance from the economic point of view has been recognized by the establishment of treatment stations and by the inauguration of educational campaigns explaining the importance of early treatment and the value of preventive measures. As regards the distribution of the species of parasite, *Necator americanus* appears to occur in Southern India, and the *Ankylostomum duodenale* in Northern India. The damp heat of the Indian coal mines is favourable to larval development, and infestation is found among the coal miners in the Madras Presidency and also in the gold miners of Mysore; it is thought probable that as the workings in the coalfields become deeper the disease will increase. Although no organized effort is made by the Government for the control and eventual eradication of the disease, the Indian Medical Service is alive to the seriousness of the problem, and is endeavouring to estimate its relative importance as a factor in the ill health of the people. Specific methods of control, which have been found to reduce the number of persons suffering from hookworm disease and the consequent anaemia, consist in the examination of the tongue and conjunctivae of the workers at least once every three months, and the administration of iron twice daily and of beta-naphthol once a month. Where this plan has been effectively carried out the labour efficiency of the coolies has, it is estimated, been increased by 25 to 50 per cent., and it is believed that what has already been accomplished in 30,000 persons with a minimum of friction could be done for the whole 300 millions. In addition to the benefits so attained, such control of disease might be expected materially to assist in the abatement of other diseases, such as cholera and plague, by overcoming prejudices against more extensive sanitary programmes. Suggestions are outlined in the article for educational campaigns, and, with Government assistance, for the building and management of latrines, for the improvement of water supply and surface drainage, and for the care of the general health.

THE Hunterian Oration before the Royal College of Surgeons of England will be delivered by Sir John Bland-Sutton on Wednesday, February 14th, at 4 p.m. The President and Council have issued invitations to a dinner in the College on the evening of the same day.

THE usual half-yearly indexes to the JOURNAL and to the SUPPLEMENT and EPITOME have been prepared. Any member or subscriber wishing to have one or all of the current indexes can obtain them post free on application to the Financial Secretary, 429, Strand, W.C.2.

NINETY-FIRST ANNUAL MEETING
of the
British Medical Association,
PORTSMOUTH, 1923.



The Golden Barque, the weather vane on St. Thomas's Church tower. Length of hull, 3 ft. 5 in.

THE ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth next summer under the Presidency of Mr. Charles P. Childe, F.R.C.S., Senior Surgeon to the Royal Portsmouth Hospital, who will deliver his Address to the Association on the evening of Tuesday, July 24th. The sectional sessions will be held on Wednesday, Thursday, and Friday, July 25th, 26th, and 27th, the scientific and clinical work of the Annual Meeting being divided among sixteen Sections, as follows: Medicine, Surgery, Obstetrics and Gynaecology, Pathology and Bacteriology, Neurology and Psychological Medicine, Ophthalmology, Public Health, Diseases of Children, Laryngology and Otology, Radiology, Naval and Military Hygiene, Tuberculosis, Medical Sociology, Orthopaedics, Venereal Diseases, and Anaesthetics. The full list of the names of officers and the provisional programme for the sectional discussions and demonstrations will be published in due course in the SUPPLEMENT. The Annual Representative Meeting for the transaction of the medico-political business will begin on the previous Friday, July 20th, at 10 a.m. Saturday, July 28th, the last day of the meeting, will be set apart for excursions to places of interest in the neighbourhood. The article published below is the second of a series of descriptive and historical notes on Portsmouth and its surroundings, for which our readers are indebted to Dr. W. Carling, Chairman of the local Printing Committee; the introductory article appeared in the JOURNAL of December 9th, 1922 (p. 1137). The Honorary Local General Secretary for the Portsmouth meeting is Mr. C. A. Scott Ridout, F.R.C.S. (St. Elmo, Clarendon Road, Southsea).

AN OUTLINE OF PORTSMOUTH HISTORY.

I. PORT DOCK AND HARBOUR.

"Would you lift the veil, long fallen, on the Ages rolled away
And sealed as a Past Forgotten? Who knows but perchance ye may
If ye go as little Children, and dream on the upland sward,
But they pass no doubting cynic where the Gods keep watch and ward."

Mr. H. G. Wells, the writer of many thought-provoking books, once lived on Portsea Island. Before he became an author he worked and lived in one of Portsmouth's emporiums. He, in the imagination of one of his created characters, came after a dusty journey and rested on the side of Portsdown Hill. He philosophized and enjoyed the not unpleasing picture of the Solent tinted with the rays of the setting sun. He, like many another Portmuthian has done and will do again in the future, pondered how and why Portsmouth should have been built on that mudflat island and not on the protected and sunny side of Portsdown. Indeed, quite recently Portsmouth did extend her boundaries, and has included Portsdown within her borough jurisdiction. In fact, new houses are beginning to dot the sunny face of the down. Sitting up here against the thyme-scented short grass on the chalk, one sees the Wight standing clear in the sea. Below at the foot of the down is a stretch of flat land intersected here and there by water channels, bays, and harbours, and between the flats and the Wight a narrow channel of the sea—the silvery Solent. Here, contemplating the harbour and its creeks, one is struck by its sheltered position and the many places a vessel could rest in without being seen. Hills to the north, and at the south a narrow entrance, easily defended if need be, opening from a sheltered strait protected from the storms of the channel by the Wight.

Should the visitor have with him a map of England he will on looking at it soon be struck with another fact. The coastline is much broken up and there are many places where the arms of the sea run a long way inland. Now let him take a blade of grass, if he has nothing else, and cut it according to the scale of his map to measure seventy-five miles. Place the scale anywhere on the map, one end on the seacoast, and he will find there is scarcely a town or village not reached by the other end. In the days when there were no aeroplanes, no motor lorries, no railway trains, methods of transport were indeed cumbersome and slow on land. It was then the day of the small ship; towns near and on the coast were able to exchange their marketable goods by water transport. Thus all round the coast, wherever there was a convenient or natural anchorage, there we have a town and port. Harbours were essential for the growth of the country.

Most towns have grown up round some hallowed spot sacred to history or romance, round some aerie castle, revered shrine or well, round some stately manor house with its family traditions of chivalry and statesmancraft, round some spot of beauty or utility. Portsmouth grew up round its harbour. The land-locked harbour we have been watching

from the hill called Portsmouth into being, and Portsmouth itself called into being its docks, its fortresses, its castle and its hospice, and its sunny Southsea.

Ever since his appearance on this globe man has been a wanderer; his face is ever set towards the west, and the British Isles come right in the track of the setting sun. Palaeolithic man was here when it was possible to cross from France on dry land. His flint implements have been found on Southsea Common. He did not found Portsmouth, neither did the Neolithic man who followed him, bringing his beautifully wrought and polished stone and bone artifects. The men of Bronze may have come this way, landing at the top of the harbour, for they have left their earthworks or rings, their long barrows and their round barrows, scattered over Hampshire and Wiltshire. The westward thrust, started by the drift of population, next brought to these isles from Europe two tribes of Celts or iron-using peoples. One has been distinguished as Gaelic (and their descendants may perhaps be found to this day in Ireland and Scotland) and the other as Brythons. The second race had learned on the Continent to smelt iron and to build boats. Their boats were swift and were used as models by the Romans when they came. The sails were dyed blue, probably for the same reason that a modern ship is painted slate colour. The Brythons were later joined by a tribe closely related to them—the Belgae. The latter were very famous for their iron work, and were at one time strongly established on the site that is now occupied by the city of Winchester.

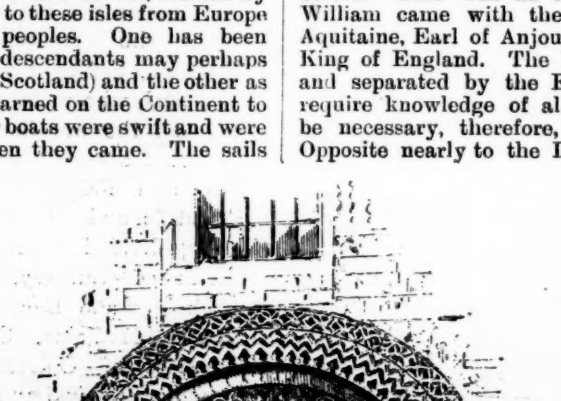
The inhabitants of Britain were a highly civilized people when Caesar appeared amongst them. They had regularly planned towns and villages, agriculture was developed, the crafts of weaving, pottery making, and metal working were practised. For warfare they had chariots and horses, they used metal coins for barter, and they had an overseas trade through Phoenician mariners.

Ships when first built must of necessity have been small in size, and neither could they for many reasons be at sea for any length of time, nor could they go far from the sight of land. Consequently it would be quite natural for them to hug the shore and be on the lookout for estuaries, creeks, natural harbours, and protected waterways. Now, where could these creek-seeking men find a better place than the protected waters of the Solent or a more convenient harbour than that between the mainland and the Isle of Portsea—a narrow entrance easily watched and if need be protected; with waters broadening out and many creeks and bends in which to hide; plenty of soft mud banks on which to run the boats for repair and rest, and the chalk hills on the north preventing any sudden invasion from the mainland? Here at the north-west corner of the harbour the Britons had a town and a landing place, and here on the same spot the Romans established the westernmost station of the "Litus Saxonicum." Thus for 2,000 years of historic time has Portsmouth harbour been a centre of naval and maritime activity. Roman Porchester was a castle enclosing an area of 9 acres, and its walls, as measured to-day, are 10 feet thick.

After the Roman departure Saxons and Jutes landed at Porchester, and have left their marks behind all along the Meon Valley. The *Anglo-Saxon Chronicle* records a legend that in A.D. 501 "Port and his two sons, Beida and Maegla, came into Britain with two ships at a place called Ports Mutha." Whether this story be true or not there is plenty of evidence of Saxon occupation in the neighbourhood. The record follows the account of the landing in 495 of Cedric, who became the first King of the West Saxons.

In 860 Danes landed at Southampton and Porchester, established themselves on shore, and proceeded to Winchester and took the city. Alfred was now king, and came to the conclusion that the Danes must be met on the sea; he therefore turned his mind to ship building and ship designing. In 893 "he gave orders for building against the Esks long ships which were full nigh twice as long as the others. Some had sixty oars, some more; they were not shaped after the Frisian model, but so as he himself thought they might be most serviceable." This is interesting as the first indication of a British navy. Most of the fighting was done off the Hampshire coast, and a few years ago the remains of a Danish ship, 30 feet long, was found near here up the Hamble River.

Our next invaders were the Normans, who when their conquest was complete built a castle at Porchester on the Roman site. The Norman invasion was different in character and purpose from those that had taken place before. This was an extension of the Norman kingdom. William came with the titles of Duke of Normandy and Aquitaine, Earl of Anjou, and added to his royal roll that of King of England. The Norman kingdom was now divided and separated by the English Channel. The king would require knowledge of all parts of his kingdom. It would be necessary, therefore, for ships to cross the channel. Opposite nearly to the Isle of Wight were the ports of Barfleur and Honfleur. What more natural than that ships from these ports should make for the sheltered waters of the Solent. In fact, for the crossings of the early Norman kings of England first Southampton, then Porchester, and finally Portsmouth became the port of embarkation. From 1066 to 1204 Hampshire was the heart of the Norman kingdom.



West doorway, Porchester Church.

Domesday Book makes no mention of Portsmouth nor of Portsea Island, but speaks of Bedhampton, Wymering, Cosham, Boarhunt, Porchester, Buckland, Copnor, and Fratton as making up the "Hundred of Portsdown." The last three manors mentioned are situated on the Isle of Portsea, and now form part of the borough of Portsmouth. Buckland was held by Hugh de Port, who held fifty-five other manors in this country direct from the Crown, besides some others indirectly. In 1085 there may have been a few fisher folk living at the south-west corner of Portsea Island; a hundred years later there were enough people living here to justify their demanding a charter. This increase was undoubtedly due to the coming and going of the Norman kings.

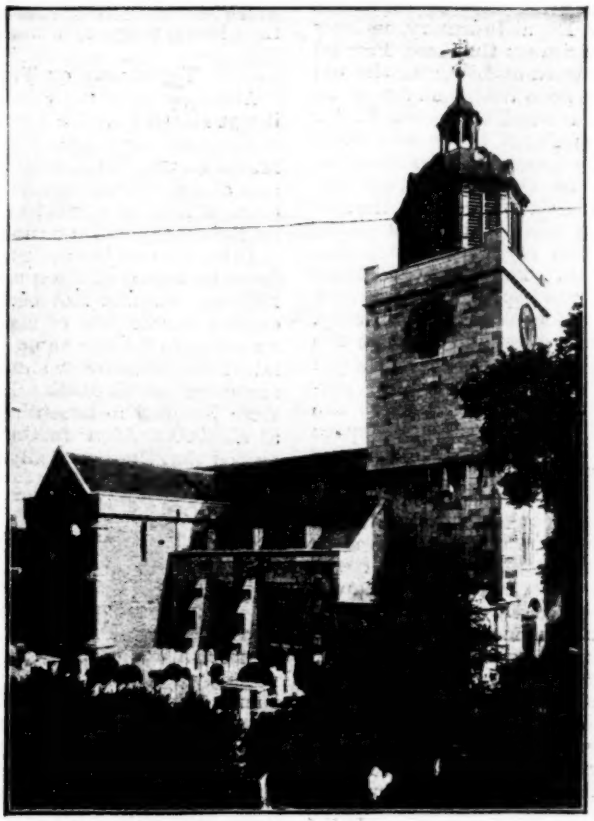
With the Norman restoration of Porchester the harbour again became important. On returning from the first Crusade Robert Duke of Normandy found his youngest brother had seized the throne. Robert gathered his forces about him and landed on the shores of Portsmouth Harbour in 1101. At West Meon he met his brother, and arranged a peace which left Henry in possession of the throne. Henry was now a frequent visitor via Winchester, Bishop's Waltham, and Wickham to Portsmouth Harbour. The *Chronicle* tells of his taking ship here in October, 1114, and again at Whitsun, 1123. On this latter occasion he stayed on board a ship for a week awaiting fine weather in order to cross the channel. This was probably a matter of great importance to Portsmouth. The narrow entrance to the harbour, the wide expanse of land-locked water—calm within, rough without—must have impressed on the minds of the travellers a great feeling of security. The king, too, would remember that only a few years before his brother had landed here without opposition. The old castle being restored, Henry I in 1133 founded here the Priory of St. Mary at Porchester for Canons Regular of the Order of St. Augustine, "for the benefit of the souls of his Father and Mother, and William (Rufus) his brother, his ancestors and successors, and for the prosperity and safety of his kingdom." Forty years later, for some unknown reason, the Priory migrated to Southwick, on the other side of Portsdown Hill. All that now remains of the Priory buildings is

the beautiful church of St. Mary. The west front has a fine decorated Norman doorway similar to that at Iffley. Like the Oxford gateway, it has a sculptured figure of Sagittarius, and as this figure occurs in the badge of Stephen it may be that the church was completed in his reign. The font is a richly carved specimen of Early Norman work.

The commencement of the civil wars in Stephen's reign began with the landing of Matilda on the shores of Portsmouth Harbour.

It is recorded that Henry II crossed from and returned to Portsmouth Harbour at least ten times. In 1177 he ordered most of the shipping of England and Normandy to assemble here to transport an army to Barfleur.

Richard Coeur de Lion was in France when his father died. He returned to England via Portsmouth and immediately set to work to organize his crusade. On returning from Palestine he was detained a prisoner through the treachery of the King of France. Eventually, on reaching England he held a conference with his barons at Bishop's Waltham and immediately set to work to gather an army and fleet together in Portsmouth Harbour to avenge the insult. Whilst these preparations were in progress he was compelled to remain some time in the little town of Portsmouth, and it is reported of him that he passed the time superintending the erection of a hall with a kitchen and private apartment for himself. The spot chosen for the royal residence is now covered by the Clarence Barracks. Richard not only built for himself but granted sites to his followers on which they could build, but more important than all this he later gave the townstolk their first charter, which bears the date May 2nd, 1194. During Richard's enforced detention in Austria, John de Gisors, Lord of the Burg of Portsmouth, formed a conspiracy against Richard. For this he was punished by the forfeiture of all his lands. The charter granted to the forfeited town conferred very important privileges on the burgesses, for which they had to pay into the king's exchequer £18 a year. The burgesses were now in a position to regulate trade with Normandy and other places and to extract fees from travellers who visited them. The proceeds thus obtained could be used for the benefit of the town and not for lining the pockets of the manor lord. The charter was given by the hand of Bishop William Longchamps, and contrary to all precedent he used a personal seal which had as its device a crescent and a star with eight wavy rays. These since the fourteenth century have always appeared on the borough arms.



St. Thomas's Church, Portsmouth.

The number of people living in Portsmouth up to Richard's time could not have been large. There was only one church on Portsea Island. That stood between the three manors of Copnor, Fratton, and Buckland (Portsea), on the site of the present church of St. Mary, Kingston. If it were in existence it would be the oldest building in Portsmouth. It was under the control of the Priory of Southwick. There is mention of it in 1166, and that it was dedicated to St. Mary. The remains of it were finally cleared away in 1843. The pathway from this church to Old Portsmouth can still be traced on the borough map. The oldest building in Portsmouth is the Church of St. Thomas. In 1180 (fourteen years before the granting of the charter) "John de Gisors gave an acre of his town of Portsmouth to the Black Canons of Southwick—serving God on the far side of Portsdown Hill—to build thereon a Chapel to St. Thomas the Martyr." It is not recorded that he provided the cost of the building, but he gave the convent certain properties in the neighbourhood for the perpetual upkeep of the fabric. The Chapel of St. Thomas was not originally a parish church for Portsmouth. St. Mary's was the mother church of the island, and with its daughter chapel, St. Thomas's, was the property of the Prior and Canons of Southwick. According to Messrs. Lilley and Everett:

"The work of St. Thomas's about the year 1230 was carried on by two of these Canons a senior and a junior assisted by a Chaplin and two Clerks in minor orders. They appear to have lived, all of them, in a Clergy-house at the corner of St. Thomas Street and Lombard Street on the East side of the latter diagonally opposite the Churchyard. The house had a garden by the side famous in later times for the succulence of its Warden pears. There was another garden on the North side, surrounded by a wall—a quasi-cloister—where the Canons could study their holy books and watch the grapes a-ripening."

The next oldest building on the island is the Domus Dei, of which more anon.

[Blocks kindly lent by Messrs. Charpentier, Ltd., Portsmouth.]

England and Wales.

Willesden War Memorial Hospital.

The first pavilion of the new war memorial extension of the Willesden Hospital was opened on December 15th, 1922, by Viscount Burnham. The Willesden Hospital was founded as a cottage hospital of eight beds in 1892, and was enlarged to twenty-five beds in 1899. The war led to an addition of forty beds, and the latest extension will provide a total of 120 beds. Another pavilion is to be opened next year, chiefly to increase the accommodation for the nursing and domestic staffs. The pavilion which has just been opened consists mainly of a number of private wards for paying patients; each holds one or two patients, who will pay from three to six guineas a week. Lord Burnham, in unveiling a tablet which commemorates the raising of £1,000 by the school children of Willesden for the new hospital, said that, to his mind, no part of the national equipment, about which they had good reason to be proud, was so remarkable and efficient as the voluntary hospital system. Lord Riddell and the Bishop of Willesden also spoke, paying eloquent tribute to the excellent work done by the Willesden Hospital.

Manchester Pathological Society.

At a meeting of the Manchester Pathological Society held on December 13th, 1922, with Professor Shaw Dunn, the President, in the chair, Mr. Sampson Handley read a paper on the "Pathology of the lymphatic system." Mr. Handley limited the scope of his discourse to a consideration of the nature of lupus, endeavouring to show that it is largely a lymphatic disease, that it spreads in the deep fascial lymphatics, and that the isolated nodules beyond the edge of the skin ulcer come about by extension along these vessels. Many sections were shown bearing out this hypothesis, and illustrating the absence of a network of lymphatics in the skin itself, so that lymphatic extension in the skin must needs take a circuitous course. Complete eradication of a focus of lupus can only be said to have been effected when the fascial lymphatics have been dealt with. In the discussion which

followed Professor Jamieson of Leeds did not appear to be quite satisfied that our knowledge of lymphatic supply and of the physiology of lymphatic flow was sufficiently definite to warrant absolute conclusion in pathological matters.

Scotland.

GLASGOW ROYAL INFIRMARY.

THE Lord Provost of Glasgow, Sir Thomas Paxton, presided at the time-honoured meeting between the managers and the nursing staff of Glasgow Royal Infirmary on New Year's Day. In his speech to the nurses the Lord Provost took occasion to refer to the early work of Lister in the old Royal Infirmary, and expressed the hope that it might yet be found possible to preserve the old ward, in which Lister worked, on its present site as a memorial of the great service Lister rendered to humanity. The Chairman of Managers, Mr. James Macfarlane, referred to the satisfactory and encouraging position of the infirmary, despite the time of severe industrial depression. With a continuance of public support he hoped that the completion of the reconstruction scheme could soon be proceeded with. The gate-house block would come first, and thereafter it was hoped to erect a new ophthalmic department on a site adjacent to the infirmary. What the managers required was more ground, and then the retention of the Lister ward would become possible, though not on its present site, which was needed for infirmary purposes. The university authorities had accepted the offer of the ward for re-erection in their grounds, but owing to lack of space they had to relinquish the idea. There was still less space available in the infirmary grounds as the managers desired to utilize all their space for the healing of patients, and the comfort of the suffering and those engaged in that noble work. He made bold to say that if Lord Lister were alive he would be the first to commend the position of the managers. He hoped still to see the Lister ward removed and re-erected on some suitable site in Glasgow. The treasurer gave some account of the financial position for the year just completed. General annual subscriptions for the year were £126 short of 1921, and employees' subscriptions, though reaching £28,902, showed a diminution of about £2,000. Considering trade conditions, this total showed that the working classes continued to take a very practical interest in the infirmary. Ordinary income was exceeded by expenditure by £24,325, but legacies and special donations amounted to £39,185, which after squaring the deficit in ordinary revenue left £14,860 for capital account.

EDINBURGH ROYAL INFIRMARY.

The report of the managers of the Edinburgh Royal Infirmary for the year ending September 30th, 1922, shows that the total number of patients treated during the year was 14,156, as compared with 13,635 in the previous year—an increase of 721. The largest number of in-patients on any one day was 914, as against 900 in the previous year, and the average time each patient was under treatment was 22.1 days, as against 22.2 days. The percentage of deaths to cases treated was 6.5, but if the 238 deaths occurring within forty-eight hours of admission were deducted the percentage was reduced to 4.9, or 0.5 less than in the preceding year. In addition to the 14,156 in-patients there were 42,342 out-patients. The total ordinary income was £99,171, as compared with £118,191 in 1921. Voluntary contributions amounted to £65,712, a decrease of £17,332, as compared with the preceding year, but this was mainly due to the sum of £16,097 received in 1921 from the National Relief Fund. The combined contributions from individuals, business firms, public works and establishments, the League of Subscribers, and churches, showed an increase. The League of Subscribers had raised a total sum of £18,333, and its membership is now 85,000. The ordinary expenditure for the year was £119,759—a decrease of £13,569 as compared with the year 1921. The chief economies were effected in the house steward's department, owing to a fall in the cost of food; in the medical department, chiefly due to favourable purchases made at the Government Disposal Board's sales; and in the works department, owing to a decrease in the cost of fuel and the tonnage consumed. The extraordinary income (legacies and donations of £100 and over) amounted to £80,177, while the extraordinary expenditure was £5,740, chiefly expended upon the venereal diseases department and the medical electrical department. The income of the improvements and extension fund amounted to £3,249. The cost per occupied bed was £136 14s. 3d., which was a decrease of £16 14s. 4d. on that of the previous year.

SIR NORMAN WALKER.

The Scottish Board of Health has sent the following minute of congratulation to Dr. Norman Walker:

"The Board resolved to record their deep satisfaction that the honour of knighthood should have been conferred on Dr. Norman Walker, to whom the Board have been frequently indebted for valuable assistance and advice—more especially in his capacity first as vice-chairman and latterly as chairman of the Medical and Allied Services Consultative Council. The Board offer Dr. Walker their hearty congratulations and good wishes."

TREATMENT OF TUBERCULOSIS IN PERTHSHIRE.

At a meeting of the Perthshire County Council in December it was stated that the Scottish Board of Health had approved of the plans for a joint Perth county and city sanatorium at Murie House, Errol, with seventy-five beds. The estimated cost of the scheme was £61,000, towards which a Government grant of £13,500 would be made, the remainder being provided by the county and the town council of Perth in a proportion of three-fourths to one-fourth. Discussion centred round the financial aspect of the question. Lord Forteviot said that in 1903 an estimate had been received from a Glasgow firm to erect a sanatorium of eighty beds for £9,200, while in 1919 an estimate for the same number of beds was £22,200; the latest estimate for a similar building from the same firm amounted to £32,000. He did not, therefore, think they were justified in accepting an offer for less accommodation at £61,000. After further discussion it was unanimously agreed that the Board should be asked to reconsider the whole matter.

Ireland.

FREE STATE MINISTRY OF LOCAL GOVERNMENT AND POOR LAW MEDICAL OFFICERS.

THE Irish Medical Secretary of the British Medical Association recently addressed a letter to the Ministry of Local Government (Irish Free State) with regard to the salaries of Poor Law medical officers engaged in the administration of the Medical Charities Acts, and the pensions of certain medical officers of Union hospitals who are compulsorily retired as the result of the recent amalgamation schemes of workhouses. The Minister of Local Government has in reply stated "that the aim of the Ministry is to secure that the salaries of the officers should be fixed on a suitable homogeneous basis for the whole country. To secure this result the Ministry are prepared to consider favourably revised scales of salaries for medical officers in each county in which such scales are necessary to remove existing anomalies. Meantime the Minister does not see his way to sanction any scales in excess of the existing highest scale for dispensary medical officers." The Minister also stated, with regard to the representations made as to the grievances of certain medical officers who were pensioned under the amalgamation schemes, that the Ministry will be prepared to look into any individual cases in which specific grievances are alleged.

TUBERCULOSIS SCHEME FOR COUNTY MONAGHAN.

A deputation consisting of local clergymen and Dr. J. T. Elliott, secretary of the Co. Monaghan Local Medical Committee, recently waited on the county council to urge that the tuberculosis scheme should be continued, and that steps should be taken to extend it on a wider basis than heretofore. The council agreed to adopt the suggestion and decided to appoint a whole-time tuberculosis officer for the county at a salary of £500, with £100 travelling expenses.

DAIRY AND COWSHED INSPECTION.

Lurgan and Moira Rural District Councils have decided to oppose the Belfast Corporation's bill seeking powers to control the inspection of dairies and cowsheds in the rural districts, on the ground that such powers would be calculated to set up a system of dual control which would be highly unsatisfactory. On the other hand, the Belfast Corporation justifies the main purpose of its bill on the ground that it should have a voice in the sanitation of these rural districts, from which is derived a considerable proportion of the milk supply distributed to the citizens of Belfast.

Correspondence.

APITUITARISM AND THE ANENCEPHALIC SYNDROME.

SIR,—In a brief article under the above heading in your issue of January 6th, 1923, Dr. D. L. Barlow shows that the anterior glandular portion of the pituitary gland was present in each of four anencephalic foetuses examined by him. These facts dispose conclusively of Dr. F. J. Browne's evidence for the suggestion that anencephaly is associated with faulty growth of the pituitary gland.

I wish to add one further instance in support of Dr. Barlow's proof. In 1911 I examined a fresh anencephalic foetus, in which not only the brain but all the spinal cord was absent; the peripheral nervous system and ganglia were present, as described in the case dissected by Sherrington. My own interest was then in the condition of the adrenal glands, but naturally I looked at the same time for the pituitary. A fully formed, well vascularized mass of glandular tissue (pars anterior) was easily identified. The microscopic sections show the same appearance as that figured in Dr. Barlow's article.—I am, etc.,

T. R. ELLIOTT.

University College Hospital, W.C.1, Jan. 6th.

SIR,—In your issue of January 6th (p. 15), under the heading "Apituitarism and the anencephalic syndrome," Dr. Barlow states that in four anencephalic foetuses he has found evidence of the presence of the pars anterior of the pituitary gland, and deduces from that the fact that the anencephalic syndrome described by me is no proof of the functions of the pituitary or that the internal secretions of the mother play only a very minor part in the development of the foetus.

The main object of my paper was more to draw attention to the anencephalic syndrome than to the apituitarism to which I attributed well marked cases of it. Whether the condition present in the anencephalic foetus was one of *hypo-* or a-pituitarism is a point of minor importance. Indeed, there is no doubt that in many cases, probably in most, some pituitary tissue is present, for it is almost certain that its deficiency is due, not to developmental causes, but to destruction of the gland at an early period of its growth, in consequence of its exposed position on the floor of the basis cranii. I believe the amount of destruction varies in different cases, and that in certain instances it may so far progress that no trace of pituitary tissue may be found even on microscopic examination of the entire mass of tissue overlying the sella turcica. On the other hand, a considerable amount of vascular connective tissue intermixed with nerve cells may so protect the gland that little or no destruction of it may occur. This being so, the anencephalic syndrome to which I drew attention will vary in its degree and may in certain cases be almost entirely absent. The writer of the leading article in the BRITISH MEDICAL JOURNAL to which Dr. Barlow refers says: "Some anencephalics do not show the syndrome completely. Some are of what may be called the pretty type. . . . Now, it would be most interesting to know whether in these less ugly specimens there are traces of the pituitary gland." From the description of the four specimens examined by Dr. Barlow it seems probable that all belonged to this so-called "pretty" type, and that in none was the anencephalic syndrome as described by me at all well marked—that is, protruding eyeballs due to the smallness of the orbital cavity and the large pad of fat behind the eyeball, increase of the subcutaneous fat, protrusion of the tongue due to smallness of the mouth cavity, *hyper*plasia (not *hypo*plasia as stated in Dr. Barlow's paper) of the thymus, and hypoplasia of the genitals. For example, in specimen No. 4 the "adipose tissue was of about average amount." In a good example of the syndrome one of the most striking features is the great depth of subcutaneous fat which in one of my specimens measured 1 inch in depth over the manubrium sterni. To what is this to be attributed if not to pituitary deficiency?

That thymus hyperplasia exists in the anencephalic foetus when the syndrome is well marked there is no possibility of doubt. I have worked out the mean weight ratios of the thymus in over 200 infants, and in those of 8 to 9 months' development (most anencephalic foetuses are premature) found it to be 324, the heaviest ratio being 160 and the lightest 751. In four anencephalic foetuses, on the other hand, in each case, adding one-eighth to the body weight to compensate for the absence of the brain, the thymus ratio was 94, 167, 95, and 331. In two of these cases the abnormal appearance of the thymus was most striking; quoting from my notes:

"It is a remarkably large and octopus-looking structure, consisting, in addition to the main mass, of several smaller lobes: weight 17 grams, weight ratio 94. It extends on the right side as far as the outer end of the clavicle, displacing the lung and filling the greater part of the lung space; on the left this is even more marked, the gland filling the entire upper part of the pleural cavity. The lungs on each side are rudimentary, and occupy only the lower part of the chest, having been evidently pushed down by the gland, which seems to have also interfered with their growth. Below the mid-line the thymus reaches to the diaphragm. A fairly large accessory thymus is present, and seems to be attached to the lower border of the left lateral lobe of the thyroid."

I have only once, apart from anencephaly, met with a weight ratio approaching those above quoted. In that case the infant was at term, and the ratio was 116. Apart from that one case the heaviest weight ratio I have ever met with at any age was 153. How is this hyperplasia to be explained? It surely cannot be a mere coincidence that by far the heaviest thymus glands I have ever met with were found in two out of the first five anencephalic foetuses which I examined.

The most marked example of the anencephalic syndrome that I have met with, and the one in which the above described thymus was found, was in my first specimen of anencephaly, upon which my conclusions were mainly based. In this naked-eye and microscopic examination failed to reveal evidence of pituitary tissue. In later specimens the syndrome has been less well marked, and in them I have more than once found evidence of the presence of varying amounts of pituitary tissue, but in all cases less than normal. That I did not claim its entire absence in every case is proved by the fact that I stated in my paper (p. 1), "in the monster under discussion we have a foetus which by virtue of its placental attachment to the mother is able to develop in utero to term *frequently* at least without any trace of a pituitary gland." In consequence of later findings I have been accustomed in conversation and in writing to refer to the condition in the anencephalic as one of *hypo*pituitarism or apituitarism.

I have never seriously claimed that the hypoplasia of the adrenals, which is I believe invariably present in anencephaly, is a part of the anencephalic syndrome.

So striking has this variability of the intensity of the syndrome above referred to been that in my notes of cases I have been accustomed to describe it as "well marked," "poorly marked," etc.

The sum of the matter seems to be this, that the title of my original article was somewhat unfortunate. Had it been "The anencephalic syndrome in its relation to apituitarism or hypopituitarism" my position would then have been unassailable.—I am, etc.,

F. J. BROWNE.

Edinburgh, Jan. 8th.

THE TREATMENT OF GYNAECOLOGICAL CONDITIONS BY *X* RAYS AND RADIUM.

SIR,—In Dr. Knox's paper on the treatment of gynaecological conditions by *x* rays and radium, in your issue of October 14th, 1922 (p. 678), appears the following: "In other words, can the *x*-ray method compare with the surgical so far as complete removal is concerned? The answer must be in the negative."

Yet what surgeon would believe that he is able to eradicate the multitude of lymphatics and glands of the pelvis in their immediate relations to the numerous and important blood vessels, especially the aorta and the iliacs, although such might readily be accessible to *x* rays of sufficient penetration and intensity even though containing microscopic quantities of malignant cells?

Further on appears: "Another factor of some importance is the response of the tissues to the radiation. Some may only require a large quantity of relatively long wave-lengths, while in others the shortest wave-length of the gamma rays of radium may be more suitable." If by this Dr. Knox implies that it is the actual wave-length in any specific case which is characteristic for any desired response, it would be interesting to know on what evidence he bases this opinion. The numerous experiments carried out by Kroenig and Friedrich indicate clearly that a therapeutic effect can be obtained with a definite quantity of radiation quite irrespective of the quality.—I am, etc.,

H. FLECKER, F.R.C.S.

Victoria, Australia, Dec. 1st, 1922.

DISAPPEARANCE OF RODENT ULCER AFTER ERYSIPELAS.

SIR,—I do not know whether the case I am about to relate exhibited marked leucocytosis, as the blood was not examined; but without that provision it may be accepted as supporting the contention of Dr. John T. MacLachlan (December 30th, 1922, p. 1280).

Within the last three years a panel patient under treatment for slight complaints from time to time was advised by me to have a small rodent ulcer at the left inner canthus removed by surgical operation. He refused this, and I observed the gradual enlargement until it became the size of a sixpenny piece. I was finally called in to treat him for an attack of erysipelas in the face. I noticed that the poison had entered by way of the ulcer and spread down over the left cheek. The attack was not severe, and I left him in a fortnight's time with a box of zinc ointment to apply to the ulcer, which remained red and angry. A month or two later I was informed by friends that my ointment had "cured the cancer." This seemed too flattering to be true, so I called on him to make sure. I then found that the ulcer had entirely disappeared, and only a supple white scar remained.—I am, etc.,

London, N.W., Jan. 5th. HOPE GRANT, F.R.C.S.Ed.

NON-MALIGNANT AFFECTIONS OF THE COLON (INTESTINAL STASIS).

SIR,—I feel that Mr. Paramore, when dealing with the "physics" of the abdomen in your issue of December 9th, 1922 (p. 1145), has rather overlooked the fact that it would require an enormous and continuous lateral pressure to support a weight in such a well lubricated cavity as the abdomen. The moving intestinal contents are such a weight, and I have a strong suspicion that very many cases of stasis are connected with displacement of the gut, either by gravity or by the loaded portion being squeezed out of place by the abdominal muscles, much like a cherry stone from between the fingers. This may result, secondarily, in a local inflammation which increases the effects, or if a slight inflammation first led to the collection this may be increased. Here manipulation may help.

I would agree in deprecating too much surgical interference, for I feel that the future treatment of such conditions and all "indigestions" depends on the study of the specific action of drugs on the different parts of the gut, inch by inch almost, together with the almost specific results of local stases, whether these be "burned tongue," a localized cutaneous eruption, or (possibly) an attack of gout.—I am, etc.,

London, N.W., Dec. 22nd, 1922. L. WALLACE, M.B.Oxon.

THE DEVELOPMENT OF LOA LOA IN CHRYSOPS.

SIR,—In the BRITISH MEDICAL JOURNAL of October 21st, 1922, I notice in the article by Drs. A. and S. L. M. Connal on "The development of *Loa loa* in Chrysops," on page 730, that it is stated that the geographical distribution of *Loa loa* and of Calabar swelling is limited to West Africa. In this connexion the following note may be of interest. When I was in Yambio in the Bahr el Ghazal province of the Southern Sudan in 1914 I found Chrysops in fair number. I found no cases of Calabar swellings among the natives, but two years later I met in Cairo one of the men with whom I had lived in Yambio. He told me that since he left on furlough in 1915 he had suffered from peculiar swellings and irritation in his hands and arms. He spent his furlough in Australia, and said that he had puzzled the doctors whom he saw about this condition; one at last told him that his sickness was due to Calabar swellings, and that he was the first case of this complaint to be seen in Australia. He had never been in West Africa, and travelled to Australia via Egypt.—I am, etc.,

R. Y. STONES, M.D.Lond.

Church Missionary Society, Maseno, via Kisumu, Kenya Colony.

TRAUMA AND APPENDICITIS.

SIR,—Dr. Charles J. G. Taylor's report of two cases under the heading of "Trauma and appendicitis" (January 6th, p. 17) leads me to mention a case that I have at present under my care in the Leicester Royal Infirmary.

A boy aged 12 years was playing football in the afternoon of Saturday, December 23rd, 1922, when he was kicked in the right lower abdomen by another boy. He was so badly hurt that he had to be taken home at once and put to bed. His condition got worse and he was brought into the infirmary on the afternoon of December 26th. I saw him shortly after admission and it was at once obvious that he had some grave intra-abdominal lesion. Immediate lower median laparotomy was performed and extensive suppurative peritonitis throughout the lower abdomen disclosed. This was found to be due to a gangrenous appendix, which was removed and the pelvis drained. He is making a good recovery.

The boy tells me he was perfectly well before he was kicked. If the injury and the appendicitis are merely a coincidence it is a most extraordinary one.—I am, etc.,

Leicester, Jan. 8th. F. BOLTON CARTER.

HOSPITAL POLICY.

SIR,—The chief point now seems to be to find a formula which will unite those who still sincerely desire to maintain the voluntary principle and at the same time recognize that other factors have come into play. Therefore I suggest that if there must be a Medical Staff Fund it should consist—

1. Of voluntary contributions.
2. Of contributions from contracts made with the State, local authorities, employers of labour, and other bodies, where such contracts exceed the cost of maintenance in order to contribute to the medical fund.

This proposal is simple, honest, logical, and covers the hard cases in industrial districts. "Hard cases make bad law" is a well recognized axiom, but if we can meet them without infringing the voluntary system, which is infinitely more important than the hard cases, we must do so. If a Board of Management is convinced that a hard case exists in its hospital—and any Board should be open to conviction—it would be encouraged to contribute to the Medical Staff Fund.

This proposal does not prejudice the future because it frankly recognizes the present realities of the situation, and future policy would depend on how the profession was exploited by the laity. It need not be exploited at all if good will prevails. To force the present official policy is really to take advantage of the present difficult position of voluntary hospitals, and this is surely repugnant to us. We ought to be fighting to maintain the voluntary hospital, and not to undermine its position. The official policy was started in a somewhat obscure way when some people thought the voluntary system was doomed. The position has now changed by hospitals waking up and finding new sources of income. Surely we should welcome this instead of trying to turn it to our advantage.—I am, etc.,

Letchworth, Jan. 6th. NORMAN MACFADYEN.

Universities and Colleges.

UNIVERSITY OF LONDON.

THE University medal at the M.B., B.S. examination for internal and external students, October, 1922, has been awarded to Samson Wright, of the Middlesex Hospital.

Mr. F. J. Cleminson has been recognized as a teacher of oto-rhino-laryngology at the Middlesex Hospital Medical School. Sir William Willcox has been elected chairman of the Physiological Laboratory Committee. Sir Cooper Perry has been appointed a governor of Royal Holloway College, and Dr. P. H. Mitchiner a governor of Reigate Grammar School.

A course of lectures on mental deficiency for medical officers to local authorities and medical men engaged on work for defectives will be held, at the request of the Council of the Central Association for Mental Welfare, at the central buildings of the University from May 28th to June 2nd, 1923. Amongst the lectures arranged by the Faculty of Natural Science at King's College is one by Dr. J. S. Haldane, F.R.S., on the fundamental conceptions of biology, on February 7th.

Three lectures on psychology and psychotherapy will be given in the Department of Psychology at King's College by Dr. William Brown, on Mondays at 5.30 p.m., beginning on February 19th.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD.

TWENTY-THREE scholarships and exhibitions of an aggregate total value of about £3,035, open to men and women, and tenable in the Faculties of Arts, Science, Medical Sciences, and Engineering of University College, King's College, East London College, and Bedford College will be offered for competition on Tuesday, May 1st. Fifteen medical entrance scholarships and exhibitions of an aggregate total value of about £1,530, tenable in the Faculty of Medical Sciences of University College and King's College, and in the medical schools of Westminster Hospital, King's College Hospital, University College Hospital, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital, will be offered for competition on Tuesday, June 26th. Full particulars and entry forms may be obtained from the Secretary of the Board, S. C. Ranner, M.A., The Medical School, King's College Hospital, Denmark Hill, London, S.E.5.

REPORTS ON DRUGS.

CHLOROFORM AND ETHER.

WE have received from Messrs. J. F. Macfarlan and Co., Edinburgh and London (9, Moor Lane, E.C.2), samples of chloroform and ether prepared by them. We find that both samples comply with the *B.P.* tests for purity, and inhalation tests do not disclose any difference between them and other standard samples of these anaesthetics.

Messrs. Macfarlan claim that their products can be obtained at about one-third the cost of those made from ethylic alcohol. They point out that since chloroform and ether are definite chemical substances, therefore their purity does not depend upon the raw materials used in their manufacture, but upon the skill and care with which they are prepared.

There is certainly no scientific evidence against this claim. As regards chloroform, the Anaesthetics Committee of the British Medical Association, which made a prolonged investigation of undesirable effects due to anaesthetics, stated in its report (1900) that "comparing 'pure,' 'methylated,' and other chloroforms, no evidence is afforded of one kind being safer than another." Sir William Ramsay in the same report stated that all standard samples of chloroform left the manufacturer's hands in a highly pure condition, and that the presence of undesirable side-products such as phosgene ($COCl_2$) was due to exposure to light and air, owing to the drug being stored in an improper manner.

The problem of ether has been complicated by the conclusions of Cotton and of Wallis, who claimed that pure ether had a low anaesthetic power, and that its action was increased by the presence of carbon dioxide and ethylene and other substances. In this connexion it is of interest to note that Stehle and Bourne[1] prepared highly pure ether and found that it had the same anaesthetic power as ordinary ether, or as the combination recommended by Cotton.

There is therefore no certain evidence that the action of anaesthetic ether depends on the presence of any other substance than ethylic ether. The chief requirement for anaesthetic ether appears to be that it should be a pure product and free from traces of such irritant substances as mercaptans.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee 31 cases were considered and £417 granted to 29 applicants. The following is a summary of some of the cases relieved:

Son, aged 18, of M.D.Lond. who is now insane. The applicant is now at a training college and a further eighteen months is required to complete his training. The friends are willing to contribute a sum of £50 towards the £100 required. The Fund voted £25 and the Royal Medical Benevolent Fund Guild a similar amount.

Daughter, aged 23, of M.R.C.S.Eng. and L.R.C.P.Edin. who died in 1920. The applicant is training to be a nurse, and asked the Fund to help her to purchase outfit. The sum of £7 2s. 2d. was paid by the Royal Medical Benevolent Fund Guild, and the Fund voted the sum of £4 towards this amount.

Widow, aged 40, of M.B.Lond. (1904), who died in 1918. Applicant was left to provide for her two children, aged 9 and 7, and asked for help towards education, but as her income is in excess of the condition of help from the Fund they voted the sum of £1 to qualify her for assistance from the Royal Medical Benevolent Fund Guild in helping to get the son into Epsom when old enough.

Widow, aged 45, of M.B., C.M. (1893), who died in January, 1922, leaving only £120 for applicant and three sons. This case received grants from the War Emergency Fund, and at present this Fund is paying the sum of £45 for one year's school fees for the youngest son. Another fund is helping with the maintenance grant, and the current expenses of the twelve months have reduced the applicant's balance to £30. The older son is a clerk who earns £100 per annum, out of which he gives his mother £40 towards his keep. The rent of a small flat amounts to £78 per annum. Voted £18 in twelve instalments.

Daughter, aged 66, of M.D.Lond. who died in 1885. This applicant was able until recently to earn money at needlework, but owing to ill health and failing eyesight had to give it up. She was granted by the Fund in March, 1922, £26 in twelve instalments. This case was chosen as the most deserving to receive a special grant of £1 which has been given to the Fund for a suitable unmarried grantee.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., C.B., M.S., F.R.C.S., at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is overwhelmed in these days of exorbitant prices for clothing and household necessities with applications for coats and skirts for ladies and girls holding secretarial posts, and suits for working boys. The Guild appeals for second-hand clothes and household articles for the benefit of the widows and children who in happier times would not have needed assistance. The gifts should be sent to the Secretary of the Guild, 43, Bolsover Street, W.1.

[1] R. L. Stehle and W. Bourne: *Journ. of Amer. Med. Assoc.*, 79, 375, 1922.

Obituary.

D. G. THOMSON, C.B.E., M.D.,

Late Medical Superintendent, Norfolk County Medical Hospital; Past President, Medico-Psychological Association.

WE much regret to record the death of Dr. D. G. Thomson, for many years medical superintendent of the Norfolk County Mental Hospital, and from 1915 to 1919 commanding officer of the Norfolk War Hospital, with the rank of lieutenant-colonel R.A.M.C. He had recovered sufficiently from a recent severe illness to be able to spend Christmas with his son-in-law at Lingwood, near Norwich; but soon after he had a relapse and died on January 4th.

David George Thomson was born at Edinburgh in 1856, the son of Thomas Thomson of Princes Street. His younger brother is Professor Alexis Thomson, the distinguished Edinburgh surgeon. After studying in the University of Edinburgh and at Dunkirk and Dresden, he graduated M.B., C.M.Edin. in 1878, proceeding M.D., with honours, in 1881. Having served as house-surgeon at the Edinburgh Royal Infirmary, he began to apply himself to the study of mental disorder, and held in succession the post of assistant medical officer at the Derby County Mental Hospital and at Camberwell House, London. He was next appointed senior assistant medical officer to the London County Asylum at Cane Hill.

At the close of 1886 he was appointed medical superintendent of the Norfolk County Mental Hospital at Thorpe, Norwich, and held that office with great distinction for the long period of thirty-five years. During that time the institution grew much in size, and many and great improvements were effected. In July, 1914, the centenary of the opening of the hospital was commemorated by the holding of the annual meeting of the Medico-Psychological Association of Great Britain and Ireland at the hospital, under the presidency of Dr. Thomson. His presidential address gave an account of the development of psychological medicine in the preceding hundred years, together with a short history of the Norfolk Mental Hospital during that period, the oldest institution of its kind in this country. In this he discussed the origin and evolution of the laws relating to the insane, the growth of humanity in the treatment of the mentally afflicted, and the progress of the science of psychiatry. Twelve months later, towards the end of the first year of the war, the Norfolk Mental Hospital was taken over by the War Office for conversion into a military hospital, with Dr. Thomson as commanding officer. How the difficult task of reorganization was faced and accomplished was described by him in a paper in the *Journal of Mental Science* in 1916 and in an appendix to his Annual Report for 1920. Transport arrangements by road and rail had to be made for evacuation of the mental patients and their accompanying staff and documents. Within twelve days 960 persons were safely transferred to Ipswich, Melton, Colchester, Brentwood, Aylesbury, St. Albans, Arlesey, Goodmayes, and Cambridge. Some of the patients had been at the asylum for over fifty years and could remember no other home; many had never been in a railway train. Then came the necessary structural changes involved in the conversion of a large asylum into a military hospital of 1,000 beds at a cost of some £16 000. Eventually the total available accommodation of the Norfolk War Hospital grew to 2,423 beds, remaining at this figure from the spring of 1918 until its demobilization in April, 1919. During the four years and a half 45,000 sick and wounded soldiers passed through the wards.

In the autumn of 1915 Colonel Thomson took over the military supervision of all the auxiliary hospitals in Norfolk—some 60 in number—and these were henceforward affiliated to the Norfolk War Hospital for purposes of administration, inspection, and supply. This heavy task, like all others he undertook, was carried through with conspicuous success. For his war services Thomson was awarded the C.B.E., and retained his rank of lieutenant-colonel R.A.M.C. In December, 1919, the permanent heads of departments of the war hospital and the members of the medical staff made him presentations as a mark of their esteem and in remembrance of the privilege they all had of working under him during the war. Early last year, on retiring from the post of medical superintendent of the institution (once again the Norfolk County Mental Hospital), he was the recipient of a further presentation, and was appointed medical adviser to the Mental Deficiency Acts Committee of the Norfolk County Council. In retirement at his home in Norwich he continued also to

act as Honorary Consulting Physician to the National Association for the Care of the Feeble-minded.

He remained in office as President of the Medico-Psychological Association throughout the period of the war. For many years he had lent his influence to the cause of reform, urging the need for properly equipped clinics for the treatment of early and incipient forms of mental disorder, and for the training of young medical practitioners in psychiatry. In 1919 his successor in the presidency, Dr. Hubert Bond, reviewed the progress that had been made towards realizing the measures powerfully advocated in 1908 by Thomson for providing adequate instruction in psychiatry. Besides his advocacy of mental clinics and schools of psychiatry, Thomson wrote and spoke on the need for removing the disabilities of the asylum medical service, and thus encouraging young graduates to look on psychiatry as a career in medicine.

Thomson was a loyal and devoted member of the British Medical Association and served it well in many capacities. He was Honorary Secretary of the East Norfolk Division from its formation in 1903 until 1920 and represented it on the Representative Body of the Association. He was a member of the Norfolk Branch Council, and was President of the old East Anglian Branch in 1909. In 1913 he received from the medical practitioners of Norfolk a presentation of plate in recognition of his great services to the Division and also of his work as honorary secretary of the Norfolk Insurance Committee. At the Annual Meeting of the Association held in London in 1910 he was Vice-President of the Section of Psychological Medicine and Neurology. He was for some years a valued member of the Medico-Political Committee, of the Medico-Legal Subcommittee, and of the Asylum Assistant Medical Officers' Subcommittee; and during the war, notwithstanding his many other duties, he found time to serve as secretary of the Local Medical War Committee for East Norfolk. From 1918 to 1919 he was a member of the Central Council of the Association.

The funeral took place at Lingwood on January 8th. Sir Hamilton Ballance represented the Council of the British Medical Association; Mr. Blaxland and Dr. Cleveland the Norfolk Branch; and Dr. Ian Dickson the Norwich Division of the Association. Representatives of the Norfolk Mental Hospital included Dr. O. G. Connell, medical superintendent, and Dr. A. W. B. Livesay, senior medical officer. The Board of Control was represented by Dr. C. Hubert Bond, who, together with Dr. Rice and Dr. Livesay, also represented the Medico-Psychological Association. The Norwich Medico-Chirurgical Society was represented by Dr. Crook, Mr. Maxted, and Dr. Starling.

The MEDICAL SECRETARY writes: I am glad to have the opportunity of paying my respects to the memory of one of the best British Medical Association workers I have known. He was not a man whose intimacy was easily reached, but those who knew him well realized his great ability, his soundness of judgement, his acute sense of humour, and, above all, his intense devotion to the Association. There was nothing the Association could ask of him that he was not prepared to do with all his might, though always keeping well out of the limelight. He was a signal refutation of the theory held by some that to do good work for general practitioners a man must be in general practice himself, because though Thomson had never been in general practice he was completely trusted by his constituents, who knew that he would never let them down. And well he deserved their trust. He regarded himself as the shepherd of the East Norfolk Division, and it was his pride to say, as he often did, that the Association could always depend on his men. He will be greatly missed by his friends in the Representative Body, of which he was a member and attended uninterruptedly from 1907 to 1922. I have lost one of my best friends in the Association, and wish to extend my sympathy not only to his family but to the East Norfolk practitioners, to whom for so many years he cheerfully gave of his very best.

HARRY RAINY, M.A., M.D., F.R.C.P.E.,

Physician, Edinburgh Royal Infirmary.

DR. HARRY RAINY, one of Edinburgh's distinguished graduates, physicians, and teachers, died on January 4th at his residence in that city. For some months his health had been giving anxiety to his friends, and, although there had been improvement recently, the end was not unexpected. He was in his fifty-ninth year.

Dr. Rainy came of a family distinguished both in medicine and the church. His great-grandfather was George Rainy, minister of Criech in Sutherlandshire, and his grandfather was Professor Harry Rainy, a student of medicine both in Glasgow and Edinburgh, an M.D. of the former (1833), and the professor of forensic medicine and medical jurisprudence in its university (1841–62). Professor Rainy's second son, George, was also M.D. of Glasgow and surgeon to the Eye Infirmary there; he was the father of the subject of this notice.

Whilst Professor Harry Rainy of Glasgow played a leading part in the great ecclesiastical movement which terminated in 1843 in the Disruption and in the formation of the Free Church of Scotland, his eldest son, Robert Rainy, D.D., uncle, therefore, of the subject of this memoir, was a leader of the Free Church, Principal of New College, and Moderator of the first Assembly of the United Free Church in 1900. With such an ancestry it is no wonder that Dr. Harry Rainy made a mark in medicine and took more than a passing interest in church affairs. He was an elder in the New North United Free Church, Edinburgh, and an ardent supporter of the movement for union between the two churches whose separation constituted the Disruption in 1843.

Harry Rainy was born in Glasgow in 1864. He received his education in Edinburgh at the Academy and the University. He graduated M.A. in 1885 and M.B. and C.M. in 1891; he was the most distinguished student of his year in medicine, gaining the Ettles Scholarship. He built up an important consulting connexion as a physician. He was among the first in Edinburgh to use the *x* rays extensively in diagnosis. With his friend, Dr. Robert Hutchison, he wrote an admirable students' textbook entitled *Clinical Methods*, which, published in 1897, has passed through a number of editions. In 1895 he had passed the examinations for the membership of the Royal College of Physicians of Edinburgh and in 1896 he was elected to the Fellowship. He was soon appointed an examiner in medicine in that college; he acted for many years as honorary secretary; served for five years on the Council, and was for a time vice-president. In 1899 he graduated M.D.; his thesis, which was deemed worthy of competing for a gold medal, was on the action of toxic substances on spinal stichochrome cells. In 1907, when he attended the bicentenary celebrations of the birth of Linnaeus in Sweden as one of the representatives of the Royal College of Physicians of Edinburgh, he was given the honorary doctorate of medicine by the University of Upsala. Meanwhile Dr. Rainy was rapidly making his influence felt in Edinburgh: he was lecturing on the principles and practice of medicine in the Extramural Medical School; he was acting as one of the physicians to the New Town Dispensary; and he was doing good work as honorary medical electrician to the Royal Hospital for Sick Children. In 1912 he was appointed lecturer on physical methods in the treatment of disease in the University of Edinburgh; he was one of the physicians to the Edinburgh Royal Infirmary and extern examiner in medicine in the University of Aberdeen; and was elected a Fellow of the Royal Society of Edinburgh. Comparatively recently he succeeded Dr. Craufurd Dunlop as medical adviser to the Prison Commission for Scotland; and just a few weeks before his death he was appointed physician to the Longmore Hospital for Incurables in place of the late Sir James Affleck. In 1918 also he was nominated by the University Court as senior lecturer on clinical medicine in charge of wards in the Royal Infirmary. During all these years of constant work Dr. Rainy found time to contribute to the literature of his profession; in addition to *Clinical Methods* he wrote on the pathology of Friedreich's ataxia, on congenital facial diplegia due to nuclear lesions, on skiagraphic researches in teratology, on clinical methods of estimation of sugar in the blood, and on dyspnoea (in the second edition of the *Encyclopaedia Medica*).

Dr. Rainy's qualifications were conspicuous in several directions. He was a deft administrator; his counsel, founded on great experience and on sure knowledge, was highly valued in all the public bodies with which he was associated, as for instance in the Governing Board of the School of Medicine of the Royal Colleges, where he was one of the representatives of the Royal College of Physicians. As an investigator of scientific problems he was critical to a degree, never failing to submit his own work to the same trial as by fire to which he subjected that of others. He was a fair, if searching, examiner, free from fads. As a teacher he showed something of the equipment of his revered master, the late Professor Greenfield; in other words, he delighted to educate his pupils by

helping them to demonstrate to themselves (and incidentally to others) their amazing lack of precise knowledge; but underneath his searching methods there was never lacking a redeeming and saving humour, often coming in where and when least expected, and always carrying away with it every trace of chagrin or soreness. It is reported that once when he was teaching clinical medicine to women students he remarked that the class notices were not being attended to, and that, in future, he had given orders they should be hung up immediately under the mirror on the wall of the dressing room! His humour peeped out too in the word *pluvium*, which he chose for his abbreviated telegraphic address.

As has been already noted, Dr. Rainy shared with his relatives an interest in ecclesiastical matters which was deeper even than that of the average Scotsman. He acted as superintendent of sabbath schools in his own congregation, and he was nearly always returned as a Representative Elder to the General Assembly of the Church. He was beloved by his patients, and his opinion as a consultant was placed high. There was yet another sphere in which he shone. His friends found that his mind was stocked with the best passages from the best authors; he was at home in the classics of all ages and times, from Plato and Euripides (how he loved Gilbert Murray's translations!) to Dante and Bunyan. It was no longer ago than New Year's Day that he showed with pride to the writer of this obituary notice an early edition of the *Divina Commedia* which he had recently acquired. Here, too, his sense of humour came in, for he enjoyed nothing so much as a clever parody such as Kipling and Graves have given of the almost unknown *fifth* book of Horace's *Odes*. He had a fine taste in music, too, and could discourse with understanding of the Gregorian chant. Dr. Harry Rainy leaves a place in medical Edinburgh which will not soon be filled, a place which he had made all his own and had furnished with gifts of intellect and character of unusual brilliancy and depth.

The funeral took place on Monday, January 8th, from the New North Church to Rosebank Cemetery, and was attended by the Vice-President and the Fellows of the Royal College of Physicians, by representatives of the University and Royal Infirmary, and many others.

A. MAXWELL WILLIAMSON, M.D., B.Sc.,
M.O.H. City of Edinburgh.

DR. ALFRED MAXWELL WILLIAMSON, after a serious illness of some three months' duration, died on January 5th, at the Palace Hotel, Castle Street, Edinburgh, which had been his home for the past sixteen years. Like Dr. Harry Rainy, whose death occurred only a day before, Dr. Williamson never married; he gave all his time and energy to the work of his office as medical officer of health to the city of Edinburgh, and he achieved results of the highest importance to the Scottish capital and to the country at large.

He was the son of a medical man in Leith (now a part of the "extended Edinburgh"), and was born there in 1859. At first his bent was towards the sea, and he was trained as an engineer in one of the shipbuilding firms in his native town. Then he turned to the profession of his father and studied medicine in the University of Edinburgh, and graduated M.B. and C.M. in 1888 when he was 29 years old. He took the B.Sc. in Public Health in 1890, and from that time till his death his life was more or less intimately bound up with the maintenance of the public welfare of the city which was ultimately to be amalgamated with Leith; it is a somewhat interesting fact that some of the strongest arguments which in the end brought about this amalgamation were those founded on the desirability of conjoining in one the health activities of the two neighbouring towns. In 1899 Williamson graduated M.D. in the University of Edinburgh; his thesis, which was deemed worthy of competing for a gold medal, had as its subject the infectivity of tuberculous meat and the methods of tuberculous meat inspection employed in public abattoirs, and embodied a criticism of the report of the Royal Commission on Tuberculosis.

In 1891 Dr. Williamson was appointed an assistant to Sir Henry Littlejohn, then the active and distinguished medical officer of health for Edinburgh. He occupied this post for six years, acting for a short period as temporary medical officer in Sir Henry's absence, and again for a three months' interval performing the duties of Dr. Wood (then seriously ill) as medical superintendent of the City Hospital. Dr. Williamson was especially appointed to deal with the outbreak of small-pox in 1894–95 and with the system of free vaccination which was then offered to the citizens. In 1898 he was made chief sanitary inspector to the city, and had the responsibility of organizing a new department and of getting to know the health conditions of the town in a way which enabled him later to work so efficiently in the post of medical officer of health, which, on the retirement of Sir Henry Littlejohn, became vacant in 1908. Events more than justified the wisdom of the choice which gave this important post to Dr. Williamson. He did other things than those that fell to him in his civic appointment—for instance, he was examiner in medical jurisprudence and public health for the Colleges of Physicians and Surgeons and in public health for the University; he had also been President of the Society of Medical Officers of Health of Scotland—but the business of the medical officership of health was his life-work.

Dr. Maxwell Williamson's tenure of office coincided with the coming into force of a number of legislative enactments which had a profound influence upon public health activities everywhere and gave a special tinge and character to his work. He was quick to see their bearing upon local conditions, and had a scheme ready for acceptance as soon as the way opened for it. It was so with tuberculosis (under the National Insurance Act), and rapidly provision was made at the City Hospital, at the Victoria Hospital, and elsewhere for the treatment of this disease; it was so again with mother and child welfare (under the Births (Extension) Act, the Midwives Act, and the Maternity and Child Welfare Act), and immediately centres (preventive and curative) sprang up all over the city, and the Royal Maternity Hospital and various dispensaries were swept into the City of Edinburgh Welfare Scheme; when the report of a Royal Commission and the discovery of better means for diagnosing and treating the venereal diseases brought these matters into the public eye the medical officer of health was prepared with a scheme to utilize all this at once for the well-being not only of Edinburgh but of many of the surrounding districts too. Sir Henry Littlejohn had foreseen many of these developments and had as far as possible prepared for them, but it fell to Dr. Williamson to carry them out and to witness a fall in the total death rate, a fall in the infantile death rate, and a lessening in the danger and destructiveness of the venereal diseases. Dr. Williamson never forgot his early experiences in the domain of housing, and most of the contributions which he made to medical literature (in addition, of course, to his vivid annual reports, which caused dry facts to live) were devoted to the housing problem. Thus he was the author of *Housing Conditions in their Relation to the Spread of Tuberculosis*, and he contributed to the second edition of the *Encyclopaedia Medica* an admirable article on housing, founded upon the Edinburgh conditions. He had from time to time anxious hours and days when epidemics swept over or near to the city, but he was then seen at his best, rapid and resourceful; and when mistakes were made—as on an occasion not so long ago—he was quick to recognize them and frankly to own an error and as quickly to set about on a right tack.

Dr. Williamson's care of the health of Edinburgh was well known; but to the few who were his intimate friends he seemed almost as if he added a responsibility for the ethical conditions of the city. He was deeply religious, and was much concerned by the temperance question and the social problems of city life with which he was so often in contact. He carried on a club for men and boys in the Cowgate, he was a director of the Free Breakfast Mission, and he was a constant supporter of temperance and evangelistic campaigns. He was an elder in St. George's United Free Church. The funeral at South Leith Churchyard took place on Sunday, January 7th, and was largely attended.

JOHN D. LLOYD, L.R.C.P., M.R.C.S.,
Formerly of Chirk.

DR. JOHN DANIEL LLOYD, M.B.E., J.P., who died on November 23rd, 1922, aged 73 years, received his medical training at the old Bristol School of Medicine, where W. G. Grace was one of his fellow students; he also studied at St. Bartholomew's Hospital, and took the diplomas of L.R.C.P.Edin. in 1873 and M.R.C.S.Eng. in 1874. Soon afterwards he joined a practice at Chirk, Denbighshire, where he spent the remainder of his working life. He was a justice of the peace for Denbighshire and held many public medical appointments; he was M.O.H. for Chirk and surgeon to Brynkinalt Cottage Hospital. He had held the rank of surgeon lieutenant-colonel in the Shropshire Yeomanry, and received the Territorial Decoration; he was also a Knight of Grace of the Order of St. John of Jerusalem.

For forty years Dr. Lloyd carried on successfully a very extensive general and colliery practice, and was held in high esteem by all who knew him. He took a great interest in public affairs and in the welfare of his profession; he was an active member of the British Medical Association, and had been president of the Shropshire and Mid-Wales Branch. He was a sagacious practitioner and a hard worker, who rarely took a holiday away from his practice. He was fond of all kinds of sport, and in his early days a successful steeplechase rider. He was an excellent judge of a horse and before motor cars came into regular use did his work on horseback. Occasionally, too, he was able to put in a day with the hounds. He was also interested in the gentle art of self-defence. During the later years of his life in Chirk he set himself the task of raising funds for a hospital at Chirk. He chose the site, arranged the aspect, and considered every detail of its construction. He laid the foundation stone, and before leaving Chirk had the satisfaction of seeing this hospital of sixteen beds in full working order. He was a man of sunny nature, whose geniality was appreciated even on a slight acquaintance. He has left behind him many friends to mourn his loss. He was laid to rest in Hillesley Churchyard, near Gloucester, where his wife and eldest son are also buried. He is survived by a son and a daughter.

JOHN BERRY HAYCRAFT, M.D., D.Sc.,

Emeritus Professor of Physiology, University College, South Wales.

PROFESSOR JOHN BERRY HAYCRAFT, whose death was briefly mentioned in our issue of last week, had retired from the Chair of Physiology, University College, South Wales, in 1920, when he was appointed Emeritus Professor. He had since resided in Cambridge, where he continued his physiological researches. A paper by him on the photographic kymograph is ready for publication in the *Journal of Physiology*, and just before he was attacked by his last illness he had completed a further series of experiments on the pulse.

John Berry Haycraft, whose father had the same Christian names, was born in London in 1857, and received his medical education in Edinburgh, where he graduated M.B., M.Ch., and B.Sc. in 1878; ten years later he took the degrees of M.D. and D.Sc. After working for some time in Ludwig's laboratory in Leipzig he became demonstrator of physiology in the University of Edinburgh under Professor Rutherford. After holding that position for nearly three years he was, in 1881, appointed to the newly founded chair of physiology at Mason College, Birmingham. His teaching in Birmingham was successful in attracting students, and in 1887 he accepted an invitation to take the place of Professor Rutherford, who was unable, owing to ill health, himself to conduct the classes and give the systematic lectures. When Professor Rutherford returned in 1888 Haycraft continued to take the practical courses and organized an advanced class of practical physiology. He remained in the physiological department in Edinburgh until 1892, when as the post of assistant professor of physiology, which he had been led to expect he would receive, had not been established, he went to London and was appointed a research scholar of the British Medical Association. During his years in Birmingham and Edinburgh Haycraft had been actively engaged in research and had published papers on the coagulation of the blood, a subject in which he took a deep interest; on the estimation of uric acid, on the nature of the striation of muscle, and on other subjects. In 1893, when the medical school of University College, Cardiff, was established, he was appointed to the chair of physiology, and again had the task of organizing the department. In 1899 he was laid aside for a year by an attack of hemiplegia, but made a remarkable recovery. About 1908 he began to insist on the need for a new physiological department, and his hopes were realized in 1913, when the erection of new buildings, made possible by the generous gift of Sir William James Thomas, Bt., was undertaken. Haycraft was responsible for the planning and equipment of the physiological department, which he continued to direct until 1920, when, as has been said, he retired. In 1894 he was appointed to deliver the Milroy lecture of the Royal College of Physicians, and took for his subject, "Darwinism and race progress." He was the author of the articles on animal mechanics, taste and smell in Schafer's *Textbook of Physiology* (1900), and of numerous articles in the *Journal of Physiology* and other periodical publications.

Dr. Haycraft was thrice married: his first wife, a sister of Mr. de Vere Stacpoole, was an artist and writer. He leaves a widow and two sons, one of whom is Mr. J. B. Haycraft, M.C., F.R.C.S., assistant in the surgical unit of the Welsh National School of Medicine, and honorary surgeon to the Prince of Wales's Hospital, Cardiff.

By the death of Sir FRANCIS FARMER dentistry loses a vigorous and inspiring personality. To the medical profession he was best known for his work as consulting dental surgeon to the Queen's Hospital at Sidcup. His skill and ingenuity in prosthetic dentistry were invaluable both to the operating surgeon and to the dentist. The dental profession knew him long before this as dental surgeon to the London Hospital and one of those who helped in the founding of the London Hospital School of Dentistry. He took a deep and practical interest in the dental museum of the school, which contains many specimens of his giving. Free of the cares of practice Sir Francis Farmer was a most agreeable comrade, and those who were privileged to know him will agree that as a teller of stories he was beyond compare. His sudden death will be deplored by all who knew him and his work.

We regret to record the death, at Coventry, on December 21st, 1922, of Dr. T. W. FOWLER, at the age of 61. Thomas Webb Fowler received his medical education at Queen's College, Birmingham, and took the diplomas of M.R.C.S.Eng. in 1885 and L.R.C.P.Lond. in 1887; he graduated M.B., Ch.B. of Birmingham University in 1901 and M.D. in 1906, and became F.R.C.S.Edin. in 1902. After practising for a few years at Matlock and at Birmingham, he went to Coventry in 1885 and built up a large practice there. In 1889 he was elected a member of the city council, and at the time of his death he was by length of service its senior member. Throughout his long public career public health claimed his closest interest; he brought to a successful issue schemes for a small-pox hospital and for an extension of the city hospital; he always kept a watchful eye upon the city's water supply and on his initiative a monthly analysis of the supply was instituted; he was for seventeen years chairman of the Watch Committee. In 1897, at the early age of 36, he was elected mayor of Coventry, and was re-elected at the end of his year of office. On the completion of his term he was raised to the aldermanic bench, and he was also a justice of the peace for the city. Dr. Fowler represented Coventry on the board of governors of Birmingham University, and had been chairman of the Coventry Education Committee. He held the appointment of honorary physician to the Coventry and Warwickshire Hospital, and was a member and a former president of the Coventry Division of the British Medical Association. He will long be remembered in Coventry for his energetic work in the interests of the city, for his high professional reputation, and for his kindness of heart.

WE regret to record the death of Dr. BERNARD PICKERING, which took place at his residence in Bolton on December 18th, 1922, after an illness which had lasted for about three months. He was born at Lichfield in 1881, and received his medical education at Edinburgh University, where he graduated M.B., Ch.B. in 1904. As a student he was an active member of the University Rowing Club. For three years he was house-surgeon at Bolton Infirmary, and on resigning entered into partnership with the late Dr. Jefferies. In May, 1915, he joined the R.A.M.C. and saw service in France, where he was surgical specialist in the 20th Casualty Clearing Station. Dr. Pickering was honorary assistant surgeon to the Bolton Infirmary; he was a member of the Panel Committee and had been secretary of the Bolton Medical Society. He was a quiet, unassuming man, who hated ostentation. So conscientious was he in his work and so ready to respond to all demands on his time, whatever the hour, that there is little doubt his health was so undermined as to diminish his recuperative power during his illness. His cheerful courage, his patience, and his consideration for others were characteristic, and never once failed him during his last illness. The affection in which he was held was shown at his funeral, when over thirty of his colleagues and many patients were present.

Professor JOLYET of Bordeaux, a well-known physiologist and biologist, has recently died.

Professor OBERSTEINER, the well-known neurologist of Vienna, has died at the age of 75.

The Services.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following officers.

Territorial Army: Royal Army Medical Corps.—Majors H. A. Ahrens (ret.), R. Y. Anderson, E. H. Brunt (deceased), W. F. Munro, M.C., and H. B. Low, M.C. (ret.).

Territorial Army Reserve: Royal Army Medical Corps.—Major W. A. L. Holland.

Medical News.

THE celebration at the Royal Society of Medicine of the hundredth anniversary of Pasteur's birth, to which we made reference last week, will be held on February 28th. The Bulletin of the Académie de Médecine for December 26th, 1922, contains a report of the speeches made in celebration of the one-hundredth anniversary of the birth of Pasteur, of which our Paris correspondent last week gave a spirited account. The number is illustrated by a photographic portrait of Pasteur which we have not seen before. It is a striking likeness, showing him in the prime of middle life.

LIGHT is thrown on the attitude of the rulers of public schools to science by the reception accorded at the Head Masters' Conference last week to the report of the Science Masters' Association, made at the request of the conference and of the Associated Preparatory Schools, on the teaching of elementary science and nature study in preparatory schools. The report contained proposals that two periods should be given weekly to science, or a least one period of three-quarters of an hour, and that candidates for scholarships at public schools should have the opportunity of answering questions in science in *viva voce* examination. Mr. Talbot (Haileybury) in supporting the recommendations said that boys who had not done some preliminary science at the preparatory schools were handicapped at the public schools; in the period of a boy's life which immediately preceded the public school age (13) his natural disposition was to be keen in his inquiries about things, and this was the moment to introduce him to science. Mr. Eccles (Gresham's), though in favour of the recommendations, said that the preparatory school masters were opposed to them on the ground that any time taken from Latin tended to handicap the boys in scoring for scholarships at public schools. The head master of Eton expressed the view that the burden to be placed on preparatory schools was greater than they could bear, and eventually the conference rejected the proposal that where possible two periods weekly should be given to science, but agreed that candidates for scholarships at public schools should be allowed an opportunity of answering questions in science at the *viva voce* examinations.

A NEW course of lectures at the Hospital for Sick Children, Great Ormond Street, W.C.1, commenced on Thursday last, when Dr. Thursfield spoke on the diagnosis of pulmonary tuberculosis in children of school age. The lectures, which are free to medical practitioners, will be continued on Thursdays, at 4 p.m., up till and including March 22nd. The subjects are announced each week on the last page of the SUPPLEMENT.

A NEW post-graduate course will commence at the National Hospital for the Paralysed and Epileptic, Queen Square, Bloomsbury, W.C.1, on January 22nd, and continue to March 23rd. The course will consist of lectures on the pathology of the nervous system, by Dr. J. G. Greenfield, on Mondays; out-patient clinics and clinical lectures and demonstrations on Mondays, Tuesdays, Thursdays, and Fridays. Lectures on the anatomy and physiology of the nervous system will also be given if sufficient entries are received.

A COURSE of lectures on tuberculosis and venereal disease has been arranged by the Royal Institute of Public Health. The lectures will be given at the Institute (37, Russell Square, W.C.1) on Wednesdays, at 4 p.m., from January 17th to March 21st inclusive. The lecturers are Professor Lyle Cummins, Dr. Gordon Pugh, Dr. Lisle Punch, Dr. James Watt, Dr. Hope Gosse, Colonel L. W. Harrison, Dr. Townley Clarkson, Major A. T. Frost, Dr. J. H. Sequeira, and Dr. W. J. O'Donovan. Admission is free, without ticket.

AN international congress of hydrology and climatology will be held at Brussels in September, when the hydro-mineral treatment of diseases of nutrition and of heart diseases will be discussed.

THE post-graduate lecture at the Whitworth Street West Branch of St. Mary's Hospitals, Manchester, arranged for January 19th, has been postponed till March 9th.

THE health organization of the League of Nations recently brought to a successful conclusion an international course for medical officers, in which twenty-two officials from the health services of Austria, Belgium, Bulgaria, Italy, Poland, Russia, and other countries took part. The course was held in Belgium and Italy during two and a half months, under the auspices of the directors of the Belgium and Italian health services respectively, through the aid of a grant from the Rockefeller Foundation. On the completion of the course those who took part in it assembled at Geneva, where a discussion was held on the results. Dr. D. C. Kirkhope, M.O.H. Tottenham, attended the course as an observer, as the next course is to be held in England.

THE annual meeting of the French Society of Comparative Pathology was held in Paris on December 19th, 1922, when papers were read on the action of the lung on fats, by Professor Roger; on articular and febrile symptoms of alimentary origin, by Professor Bezançon; on cancer of plants, by Professor Foëx; on gonococcal phlebitis and peri-phlebitic abscess, by Achard, Rouillard, and Bloch; on therapeutical applications of d'Herelle's phenomena, by Philibert, Handuroy, and Cordey; on researches on the physiological and therapeutical properties of tissue diastases, by Professor Maignon; on normal radiological pictures in the dog, by Taskin; on clinical applications of giant syringes, by Rosenthal; on biological causes of depopulation, by Bérillon; and on early diagnosis of pulmonary tuberculosis by x rays, by Faugère.

THE Lord Chancellor, Viscount Cave, will open the new Haslemere and District Hospital at 2 p.m. on Saturday, January 20th. The hospital is equipped for 35 beds, and has been built at a cost of £32,000, the whole of which has been raised, so that the institution starts free from debt.

THE scheme adopted last July by the Voluntary Hospitals Commission to establish a small consultative committee of members of local committees has now been carried out. Among the members are Sir David Drummond, C.B.E., M.D., representing the Northumberland Local Voluntary Hospital Committee, Sir A. Garrod Thomas, M.D. (Monmouthshire), and Colonel R. J. S. Simpson, C.B., C.M.G., late A.M.S. (Kent).

A DISCUSSION on the treatment of human trypanosomiasis will be held at the meeting of the Royal Society of Tropical Medicine and Hygiene on Thursday evening next; the value of the drug called "Bayer 205" and of tryparsamide will be discussed. Full details are to be found in the Diary.

THE question of the return of disabled men to industrial life will be discussed at the meeting of the Governing Body of the International Labour Office of the League of Nations to be held in Geneva on January 30th.

AT a sessional meeting of the Royal Sanitary Institute to be held at the Birmingham University on February 2nd and 3rd a discussion on town and country milk supplies and their improvement will be opened by Dr. John Robertson, M.O.H. Birmingham; the chair will be taken by Professor H. R. Kenwood.

AT the meeting of the Royal Statistical Society to be held at the Royal Society of Arts, John Street, Adelphi, W.C.2, at 5.15 p.m. on Tuesday next, January 16th, Dr. R. Dudfield will open a discussion on the registration of disease.

A MEETING of the Medical Prayer Union will be held by invitation of Dr. and Mrs. J. Burnett Rae, at 98, Portland Place, W.1, on Thursday, January 25th, at 8 p.m., when the Right Rev. E. A. Knox, D.D., late Bishop of Manchester, will read a paper. An intimation of intention to be present will be welcomed by the Hon. Secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

THE annual meeting of the Canadian Medical Association will be held at Montreal on June 12th, 13th, and 14th. The *Canadian Medical Association Journal* states that among those present at the annual meeting will be Sir Berkeley Moynihan, Sir Robert Jones, Sir William Taylor of Dublin, and Dr. W. J. Mayo of Rochester, U.S.A. Arrangements have been made for the meetings of other associated societies to take place at the same time.

THE next international congress of the history of medicine will be held at Geneva in 1925.

AT the meeting of the Medico-Legal Society to be held at 11, Chandos Street, W.1, on Tuesday next, at 8.30 p.m., Professor Harvey Littlejohn will read a paper on the micro-spectroscope in the medico-legal detection of blood, to be followed by a demonstration thereof. Dr. T. H. G. Shore and Sir Bernard Spilsbury will exhibit specimens.

MESSRS. CASSELL AND CO., LTD., announce for early publication a new book by Sir Frederick Treves, entitled *The Elephant Man and Other Reminiscences.*

PROFESSOR FIRKET has been elected President of the Belgian Royal Academy of Medicine.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2. on receipt of proof.

In order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

DR. HENRY WALDO (Clifton, Bristol) asks for advice as to the most suitable parts of England for a male patient, aged about 50, to live, with more or less persistent anaemia.

INCOME TAX.

"J. C." has been assessed separately for his remuneration as coroner.

*** We understand that the Board of Inland Revenue have no objection to salaries for such appointments being included with the general earnings of a medical practitioner in one sum for assessment under Schedule D; "J. C." might point this out to the local inspector. Allowances made voluntarily by relatives are not chargeable to tax on the recipient. Allowance can be claimed for the children (on the form of return or subsequently), provided they are attending recognized educational establishments for whole-time instruction. Our correspondent does not say at what sum his general earnings were assessed, and we therefore cannot deal with the other points to which he refers.

LETTERS, NOTES, ETC.

TENNIS ELBOW.

DR. J. G. M. MOLONY (Truro) writes: At the end of September, 1921, I returned from a month's holiday with a very acute tennis elbow. The pain and tenderness were typical. To lift a loaf of bread with my hand pronated was almost impossible owing to pain. The only treatment was rest, and I refrained from playing badminton during the winter. I started this year's tennis season in fear as my "elbow" was still rather tender. The condition I attribute solely to the fact that as I thought my racquet handle in 1921 was too thin for my grip I put some strapping and two layers of gauze bandage over it. I removed this artificial thickening at the beginning of the 1922 season, and have had no further trouble. Eventually, for the first three weeks of last September I played every day at least five or six sets. My arm is now perfectly well, no pain or tenderness.

A QUESTION OF PIGMENT.

CHANCE, aided by circumstance, has made us acquainted with the existence of *The Shakespearean Quarterly*, printed in Sydney, which reached its fourth number in October. The circumstance which has brought us this good fortune is that the number contains a paper by Dr. Frank A. Nyulasy of Melbourne, who is exercised by the question whether Othello was brown or black, arab or negro, and by other doubts. Professor A. C. Bradley is quoted as asserting that the stage tradition down to 1814 was that Othello was to be played as almost quite black, but it may be questioned whether Bradley's statement is correct. At the present time the stage tradition is that Othello should have a full brown complexion, not black, but nobody exactly knows how far this tradition goes back. It is really rather amusing how easily many of us get excited about a question like this, which is, in truth, insoluble. We are really trying to satisfy ourselves as to the picture Shakespeare had in his mind, for doubtless he had a picture of the Moor, since Shakespeare's visual memory was very strong.

A CATGUT HOLDER.

MR. A. P. BERTWISTLE, M.B., Ch.B., Resident Surgical Officer, General Infirmary, Leeds, writes: The need for a simple catgut holder is felt by all doing casualty work. A glass jar with an internal flange is selected and a strip of plate glass perforated in the centre is cut, the length equal to the diameter of the jar. The perforation in the strip is plugged with rubber tubing and through it the ends of several strips of catgut are drawn, the catgut being lightly rolled on glass reels. The plate is now wedged in position with the aid of rubber tubing. The design permits of a suitable length being withdrawn, the rubber preventing the end from slipping back.

PREVENTION OF VENEREAL DISEASE.

DR. C. LUNDIE (S. Africa) writes: "G.'s" comments (October 14th, 1922, p. 706) on Mr. Herbert Caiger's letter about the "Radical prevention of venereal disease," seem to me needlessly alarmist in nature. Mr. Caiger is very explicit about the slowness of his proposed method, as is made very clear when he admits, in spite of its results on the improvement of morals *between the first and the twentieth centuries*, that the results are *disappointing and inadequate to modern moralists* (italics are mine). If nearly 2,000 years of the method upheld produce only *disappointing and inadequate results in 2,000 years*, I think we may safely take it that a geological aeon will be required to accomplish what is desired; so sweaters and other oppressors of their fellow men may sit at ease and fear no revolutionary turn of events to sweep them untimely to the warmer climes that they anticipate. What works at the rate of natural evolution will work no revolutionary changes in human affairs.

If Mr. Caiger had included among the very inadequate other methods the one which is equally inefficient from an ethical point of view, but which is the most efficient deterrent to the individual sinner, I should certainly have expected an outcry, in spite of the excellent practice that the adoption of such a method would provide for young surgeons, and the restoration of balance that it would effect in the coming generation between the progeny of the survivors of the unsyphilized who were killed wholesale during the war and the syphilized who were so safe from danger during long periods at the base. Not every one had such a long time of duty (not as one promoted from the wards to the staff as so many were) in military venereal hospitals as myself, so that I do not expect even such even-handed justice as the equalizing of the chances of posterity to reconcile many to such drastic treatment; so the equalizing must be left to the disease itself with, unfortunately, much more involvement of the innocent than the deliberate administration of justice would do. I am afraid my long spell of safe and inglorious duty among the "blessés de Vénus," as a French officer once described them to me, would make me more easily reconciled to such an adjuvant to Mr. Caiger's preventive method than most would be. It is a simple little operation that has even been done with a string. It certainly might save much suffering if scientifically carried out. Further, it would postpone the time anticipated by Stefannson (in his articles contributed to *The World's Work*), when the world's food supply will run short and either plague, famine, or a still more dreadful war than the last will be necessary to adjust the population whose overstocking could have been so easily prevented surgically.

COLLOIDAL GOLD FOR THE LANGE TEST.

Correction.

DR. TEMPLE GREY calls attention to a misprint in his memorandum under the above heading printed in the JOURNAL of December 9th, 1922 (p. 1120). In the third line of the small type, for "1 c.cm. of $AuCl_3NaCl$" read "1 c.cm. of a 1 per cent. solution of $AuCl_3NaCl$" (in aq. dest.).

A DISCLAIMER.

MR. HAROLD BURROWS, F.R.C.S. (Portsmouth), writes: As the author of a book, designed solely for medical practitioners, on *Mistakes and Accidents of Surgery*, may I have the hospitality of your columns in order to disclaim any connexion with the notices of that book which have appeared in the public press? I wish it to be known that I have not granted any interviews to journalists, nor have review copies of the work been forwarded to the lay newspapers.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 34, 35, and 38 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 36 and 37.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *15*.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Six lines and under	0	9	0
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Whole single column (three columns to page)	7	10	0
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Whole page	20	0	0

An average line contains six words.

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Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.